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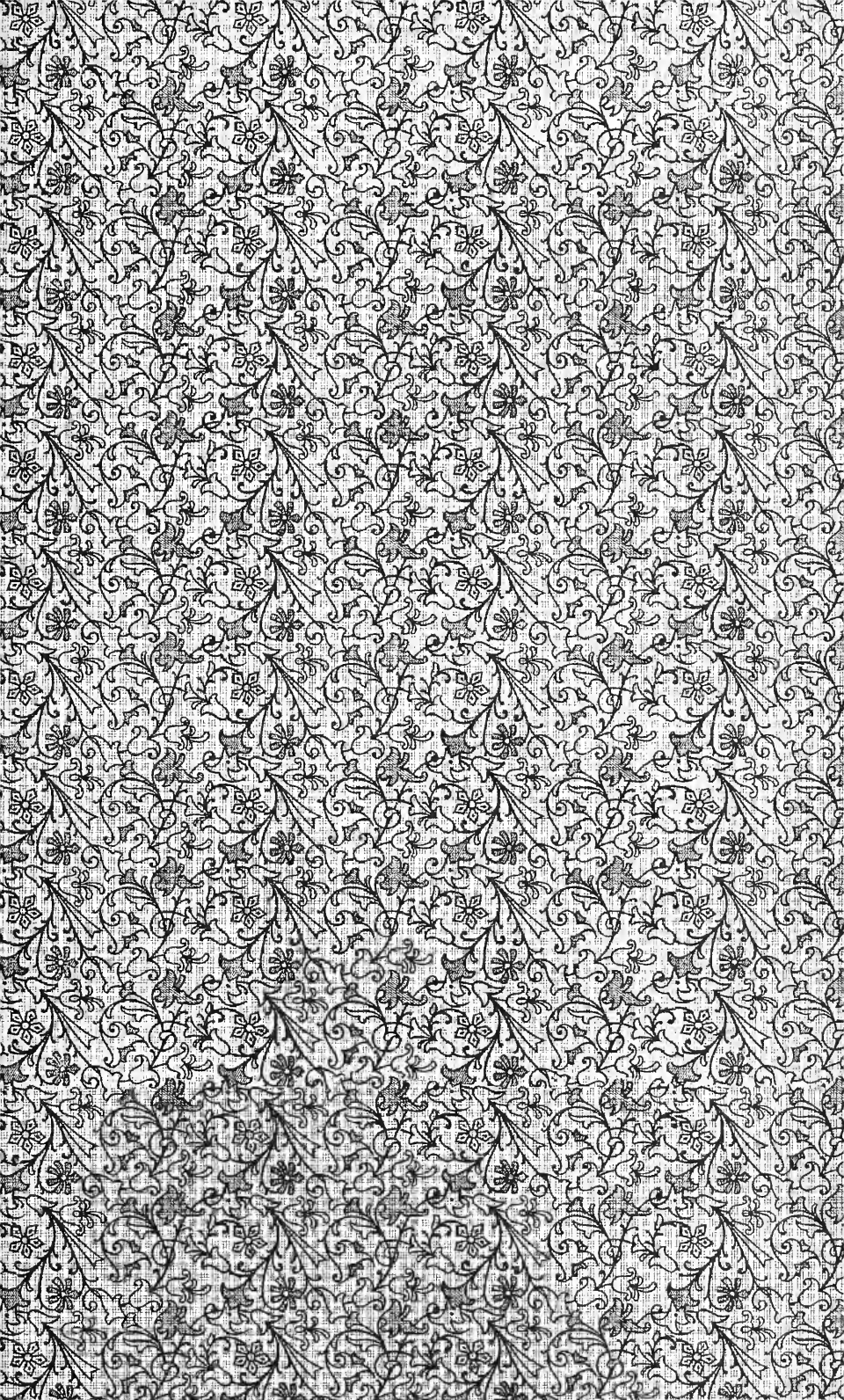


MASSACHUSETTS
AGRICULTURAL
COLLEGE

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The M. A. C. Bulletin

Amherst, Mass.

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THE M. A. C. BULLETIN

AMHERST, MASS.

Vol. VIII. No. 1.

For January, 1916

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No. 31

CATALOGUE
OF THE
MASSACHUSETTS
AGRICULTURAL COLLEGE,
1915-1916.

FIFTY-THIRD ANNUAL REPORT.
PART II.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.
1916.

Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.— *Act of Congress, July 2, 1862.*

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST.

CATALOGUE, 1915-1916.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.
1916.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

THE MASSACHUSETTS
AGRICULTURAL COLLEGE.

This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. Additional announcements are made in a supplementary bulletin, published in the spring. Beginning September, 1916, the work of the college will be given in four terms instead of two semesters; full announcements will appear in the spring supplement.

The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue. Special publication will be made should it become necessary on account of important changes.

CALENDAR.

1916-17.

REGULAR COURSES.

1916.

January 3, Monday, 1 P.M.,	Winter recess ends; regular schedule of classes.
February 7, Monday, 1 P.M.,	Second semester begins; regular schedule of classes.
February 22, Tuesday afternoon,	Half holiday, Washington's Birthday.
March 24, Friday, 5 P.M.,	Spring recess begins.
April 3, Monday, 1 P.M.,	Spring recess ends; regular schedule of classes.
April 19, Wednesday afternoon,	Half holiday, Patriots' Day.
May 30, Tuesday,	Holiday, Memorial Day.
June 17-21, Saturday-Wednesday,	Commencement.
June 22-24, Thursday-Saturday,	Entrance examinations.
September 13-16, Wednesday-Saturday,	Entrance examinations.
September 20, Wednesday, 1.30 P.M.,	Fall term begins; chapel.
October 12, Thursday afternoon,	Half holiday, Columbus Day.
November 29, Wednesday, 12 M.-Friday, December 1, 1 P.M.,	Thanksgiving recess.
December 15, Friday, 5 P.M.,	Winter term closes; Christmas recess begins.

1917.

January 1, Monday, 1 P.M.,	Christmas recess ends; winter term begins.
February 22, Thursday afternoon,	Half holiday, Washington's Birthday.
March 23, Friday, 5 P.M.,	Winter term closes; spring recess begins.
April 2, Monday, 1 P.M.,	Spring recess ends; spring term begins.
April 19, Thursday afternoon,	Half holiday, Patriots' Day.
May 30, Wednesday,	Holiday, Memorial Day.
June 23-27, Saturday-Wednesday,	Commencement.
June 27, Wednesday,	Spring term ends.
July 2, Monday,	Summer term begins.

MASSACHUSETTS AGRICULTURAL COLLEGE.

HISTORY. — The Massachusetts Agricultural College was among the first of those organized under the national land grant act of 1862. This act granted public lands to the several States and Territories, the funds realized from the sale of which should be used to establish colleges of agriculture and mechanic arts; the bill was framed by the late Senator Justin Smith Morrill of Vermont. The Legislature of Massachusetts has granted money for the erection of nearly all the buildings now on the grounds, and makes annual appropriations for the maintenance of the college.

The college was incorporated in 1863, and on the 2d of October, 1867, was formally opened to its first class of students. At that time four buildings had been erected, and there were four regular instructors employed by the institution. In 1882 the State located its agricultural experiment station on the grounds of the college. Later, after the Federal law was passed granting financial aid to experiment stations, the Massachusetts Agricultural Experiment Station was consolidated with the Federal station, and subsequently the whole was incorporated with the college.

COURSES. — The college offers an education without tuition fee to any student who is a resident of Massachusetts and who meets the requirements for admission. Women are admitted on the same basis as are men. Students who are not residents of Massachusetts are required to pay a nominal tuition fee. The four-year¹ course leads to the degree of bachelor of science, and the graduate school offers advanced courses leading to the degrees of master of science, doctor of philosophy and master of agriculture. The winter school of ten weeks, for admission to which no scholastic requirements are made, is held each winter, beginning early in January. There are other short courses at the college, such as the beekeepers' course and summer school. Various forms of extension teaching are carried on away from the college, such as correspondence courses, traveling schools, educational exhibits, lecture courses, demonstrations and circulating libraries.

PURPOSE OF THE COLLEGE. — The chief purpose of the college is to prepare men and women for the agricultural vocations. In this statement the term "agricultural vocations" is used in its broadest sense. Courses are offered which give efficient training in various agricultural pursuits, such as general farming, dairying, management of estates, poultry husbandry, fruit growing, market gardening, landscape gardening and forestry. Students are also fitted for positions in institutions designed for investigation in many sciences

¹ Twenty-seven teaching departments offer instruction in agriculture, horticulture, sciences, the humanities and rural social science. A system of major courses permits a student to elect major work in 1 of 16 departments, specializing in that and allied subjects for a period of two years.

underlying the great agricultural industry, for teaching in agricultural colleges and high schools, for scientific experts in chemistry, entomology, botany and microbiology and for business operations having connection with practical agriculture.

Though the agricultural vocations are thus the chief concern of the college, students also find the course one that fits them admirably for pursuits in which the sciences, particularly chemistry, botany and zoölogy, are an essential preparation. Still other students find the course a desirable education, without regard to future occupation. The course of study is designed to give a student a general college education, and in addition to make it possible for him to specialize in any department in which a major course is offered.

LOCATION AND EQUIPMENT. — The agricultural college is located in the town of Amherst. The grounds comprise more than 600 acres, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst is about 98 miles from Boston, and may be reached over the Central Massachusetts division of the Boston & Maine Railroad, or by way of the Central Vermont Railroad. Electric car lines connect Amherst with Northampton, Holyoke and Springfield.

THE MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Massachusetts provided for the establishment of an agricultural experiment station in 1882. This station, though on the college grounds and supported by the State, was then without organic connection with the college. Under an act of Congress, passed in 1887, an agricultural experiment station was established as a department of the college, and was supported by the general government. For a time, therefore, Massachusetts had two experiment stations at the college. In 1894 these were combined, and the station reorganized as a department of the college. It is now supported by funds from both the State and the general government. In 1906 the general government largely increased its support of experiment stations, on condition, however, that the money thus provided should be used only for research. The station now receives about one-third of its support from the State.

The station is under the direct supervision of the Board of Trustees. The chief officer is the director, who is responsible to the president and to a committee of the Board. The station is organized into a number of departments, all co-operating toward the betterment of agriculture. In most cases the heads of the station departments are heads of corresponding departments in the college. The work of the station takes three directions; namely, control work, experimentation and investigation. The station publishes numerous bulletins and two annual reports, one scientific, the other for practical farmers and for general distribution. These publications, conveying information as to results of experiments, are free, and circulate extensively, the mailing list containing some 20,000 addresses.

THE CORPORATION.

ORGANIZATION OF 1915.

MEMBERS OF THE CORPORATION.

	TERM EXPIRES
ARTHUR G. POLLARD of Lowell,	1916
CHARLES A. GLEASON of New Braintree,	1916
FRANK GERRETT of Greenfield,	1917
HAROLD L. FROST of Arlington,	1917
CHARLES H. PRESTON of Danvers,	1918
FRANK A. HOSMER of Amherst,	1918
DAVIS R. DEWEY of Cambridge,	1919
JOHN F. GANNON of Worcester,	1919
WILLIAM H. BOWKER of Concord,	1920
GEORGE H. ELLIS of West Newton,	1920
ELMER D. HOWE of Marlborough,	1921
EDMUND MORTIMER of Grafton,	1921
NATHANIEL I. BOWDITCH of Framingham,	1922
WILLIAM WHEELER of Concord,	1922

MEMBERS EX OFFICIO.

His Excellency Governor DAVID I. WALSH, *President of the Corporation.*

KENYON L. BUTTERFIELD, *President of the College.*

DAVID SNEDDEN, *State Commissioner of Education.*

WILFRID WHEELER, *Secretary of the State Board of Agriculture.*

OFFICERS OF THE CORPORATION.

His Excellency Governor DAVID I. WALSH of Boston, *President.*

CHARLES A. GLEASON of New Braintree, *Vice-President.*

WILFRID WHEELER of Concord, *Secretary.*

FRED C. KENNEY of Amherst, *Treasurer.*

CHARLES A. GLEASON of New Braintree, *Auditor.*

STANDING COMMITTEES OF THE CORPORATION.¹

Committee on Finance.

CHARLES A. GLEASON, *Chairman.*
GEORGE H. ELLIS.
NATHANIEL I. BOWDITCH.

ARTHUR G. POLLARD.
FRANK A. HOSMER.
EDMUND MORTIMER.

Committee on Course of Study and Faculty.

WILLIAM WHEELER, *Chairman.*
WILLIAM H. BOWKER.
FRANK A. HOSMER.

DAVID SNEDDEN.
ELMER D. HOWE.
DAVIS R. DEWEY.

JOHN F. GANNON.

Committee on Farm.

NATHANIEL I. BOWDITCH, *Chairman.*
FRANK GERRETT.

CHARLES A. GLEASON.
GEORGE H. ELLIS.

¹ The president of the college is ex officio member and secretary of standing committees.

Committee on Horticulture.

HAROLD L. FROST, *Chairman.*
EDMUND MORTIMER.

ELMER D. HOWE.
WILFRID WHEELER.

Committee on Experiment Department.¹

CHARLES H. PRESTON, *Chairman.*
WILFRID WHEELER.

ARTHUR G. POLLARD.
HAROLD L. FROST.

EDMUND MORTIMER.

Committee on Buildings and Arrangement of Grounds.

WILLIAM H. BOWKER, *Chairman.*
WILLIAM WHEELER.

FRANK GERRETT.
CHARLES H. PRESTON.

GEORGE H. ELLIS.

Committee on Extension Service.

ELMER D. HOWE, *Chairman.*
GEORGE H. ELLIS.
HAROLD L. FROST.

DAVIS R. DEWEY.
WILFRID WHEELER.
JOHN F. GANNON.

Examining Committee of Overseers from the State Board of Agriculture.

JOHN BURSLEY of West Barnstable.
FRANK P. NEWKIRK of Easthampton.
WILLIAM E. PATRICK of Warren.
JOHN J. ERWIN of Wayland.
CHARLES W. FREEHAN, of Great Barrington.

ORGANIZATION OF 1916.**MEMBERS OF THE CORPORATION.**

	TERM EXPIRES
FRANK GERRETT of Greenfield,	1917
HAROLD L. FROST of Arlington,	1917
CHARLES H. PRESTON of Danvers,	1918
FRANK A. HOSMER of Amherst,	1918
DAVIS R. DEWEY of Cambridge,	1919
JOHN F. GANNON of Worcester,	1919
ARTHUR G. POLLARD of Lowell,	1920
GEORGE H. ELLIS of West Newton,	1920
ELMER D. HOWE of Marlborough,	1921
EDMUND MORTIMER of Grafton,	1921
NATHANIEL I. BOWDITCH of Framingham,	1922
WILLIAM WHEELER of Concord,	1922
CHARLES A. GLEASON of New Braintree,	1923
JAMES F. BACON of Boston,	1923

MEMBERS EX OFFICIO.

His Excellency Governor SAMUEL W. MCCALL, *President of the Corporation.*
KENYON L. BUTTERFIELD, *President of the College.*
DAVID SNEDDEN, *State Commissioner of Education.*
WILFRID WHEELER, *Secretary of the State Board of Agriculture.*

OFFICERS OF THE CORPORATION.

His Excellency Governor SAMUEL W. MCCALL of Boston, *President.*
CHARLES A. GLEASON of New Braintree, *Vice-President.*
WILFRID WHEELER of Concord, *Secretary.*
FRED C. KENNEY of Amherst, *Treasurer.*
CHARLES A. GLEASON of New Braintree, *Auditor.*

¹ The director of the experiment station is a member of the committee on experiment department, without vote.

STANDING COMMITTEES OF THE CORPORATION.

*Committee on Finance.*CHARLES A. GLEASON, *Chairman.*

GEORGE H. ELLIS.

NATHANIEL I. BOWDITCH.

ARTHUR G. POLLARD.

FRANK A. HOSMER.

EDMUND MORTIMER.

*Committee on Course of Study and Faculty.*WILLIAM WHEELER, *Chairman.*

FRANK A. HOSMER.

ELMER D. HOWE.

DAVID SNEDDEN.

DAVIS R. DEWEY.

JOHN F. GANNON.

JAMES A. BACON.

*Committee on Farm.*NATHANIEL I. BOWDITCH, *Chairman.*

FRANK GERRETT.

GEORGE H. ELLIS.

EDMUND MORTIMER.

*Committee on Horticulture.*HAROLD L. FROST, *Chairman.*

CHARLES A. GLEASON.

ELMER D. HOWE.

WILFRID WHEELER.

*Committee on Experiment Department.*CHARLES H. PRESTON, *Chairman.*

WILFRID WHEELER.

ARTHUR G. POLLARD.

HAROLD L. FROST.

EDMUND MORTIMER.

*Committee on Buildings and Arrangement of Grounds.*FRANK GERRETT, *Chairman.*

WILLIAM WHEELER.

CHARLES H. PRESTON.

GEORGE H. ELLIS.

JAMES F. BACON.

*Committee on Extension Service.*ELMER D. HOWE, *Chairman.*

GEORGE H. ELLIS.

HAROLD L. FROST.

DAVIS R. DEWEY.

WILFRID WHEELER.

JOHN F. GANNON.

Examining Committee of Overseers from the State Board of Agriculture.

JOHN BURSLEY of West Barnstable.

FRANK P. NEWKIRK of Easthampton.

WILLIAM E. PATRICK of Warren.

JOHN J. ERWIN of Wayland.

CHARLES W. FREEHAN of Great Barrington.

OFFICERS OF THE INSTITUTION.

[The names of the faculty are arranged in groups according to rank. Within these groups, the order depends upon seniority of service in the college, not upon seniority of appointment to the position now held.]

THE FACULTY.

KENYON L. BUTTERFIELD, A.M., LL.D.,	President's House.
President of the College and Head of Division of Rural Social Science.	
CHARLES H. FERNALD, Ph.D.,	3 Hallock Street.
Honorary Director of the Graduate School.	
EDWARD M. LEWIS, A.M.,	19 Lincoln Avenue.
Dean of the College and Professor of Languages and Literature.	
FRED C. KENNEY,	Mount Pleasant.
Treasurer of the College.	
WILLIAM P. BROOKS, Ph.D.,	6 Farview Way.
Director of the Experiment Station and Lecturer on Soil Fertility.	
WILLIAM D. HURD, M.Agr.,	46 Amity Street.
Director of the Extension Service and Supervisor of Short Courses.	
CHARLES E. MARSHALL, Ph.D.,	44 Sunset Avenue.
Director of the Graduate School and Professor of Microbiology.	
FRANK A. WAUGH, M.Sc.,	Campus.
Head of Division of Horticulture and Professor of Landscape Gardening.	
JAMES A. FOORD, M.Sc.Agr.,	54 Lincoln Avenue.
Head of Division of Agriculture and Professor of Farm Administration.	
ROBERT J. SPRAGUE, Ph.D.,	Mount Pleasant.
Head of Division of Humanities and Professor of Economics and Sociology.	
JOSEPH B. LINDSEY, Ph.D.,	47 Lincoln Avenue.
Goessmann Professor of Chemistry.	
CHARLES WELLINGTON, Ph.D.,	34 Amity Street.
Professor of Chemistry.	
JAMES B. PAIGE, B.Sc., D.V.S.,	42 Lincoln Avenue.
Professor of Veterinary Science.	
GEORGE E. STONE, ¹ Ph.D.,	Mount Pleasant.
Professor of Botany.	
PHILIP B. HASBROUCK, B.Sc.,	130 Pleasant Street.
Registrar of the College and Professor of Physics.	
JOHN E. OSTRANDER, A.M., C.E.,	33 North Prospect Street.
Professor of Mathematics and Civil Engineering.	
HENRY T. FERNALD, Ph.D.,	44 Amity Street.
Professor of Entomology, Chairman of Division of Science.	
SIDNEY B. HASKELL, B.Sc.,	North Amherst.
Professor of Agronomy.	
WILLIAM R. HART, A.M., L.B.,	97 Pleasant Street.
Professor of Agricultural Education.	
FRED C. SEARS, M.Sc.,	Mount Pleasant.
Professor of Pomology.	
WILLIAM P. B. LOCKWOOD, M.Sc.,	34 North Prospect Street.
Professor of Dairying.	

¹ On account of ill health not in administrative charge; Associate Professor Osmun acting as head of department.

ALEXANDER E. CANCE, Ph.D.,	9 Fearing Street.
Professor of Agricultural Economics and Supervisor of Agricultural Surveys.	
JOSEPH S. CHAMBERLAIN, Ph.D.,	Mount Pleasant.
Professor of Organic and Agricultural Chemistry.	
JOHN C. GRAHAM, B.Sc.Agr.,	Lincoln Avenue.
Professor of Poultry Husbandry.	
G. CHESTER CRAMPTON, Ph.D.,	86 Pleasant Street.
Professor of Insect Morphology.	
WILLIAM D. CLARK, A.B., M.F.,	3 Mount Pleasant.
Professor of Forestry.	
CHRISTIAN I. GUNNESS, B.Sc.,	105 Butterfield Avenue.
Professor of Rural Engineering.	
HENRY W. FLEET, Lieutenant, U. S. A.,	5 Phillips Street.
Professor of Military Science and Tactics.	
HAROLD F. TOMPSON, B.Sc.,	10 Temple Street, Arlington.
Professor of Market Gardening.	
JOHN PHELAN, A.M.,	5 Allen Street.
Professor of Rural Sociology.	
JOHN C. McNUTT, ¹ B.Sc.Agr.,	5 School Street.
Professor of Animal Husbandry.	
A. VINCENT OSMUN, M.Sc.,	Kendrick Place.
Associate Professor of Botany.	
CLARENCE E. GORDON, Ph.D.,	38 Lincoln Avenue.
Associate Professor of Zoölogy and Geology.	
ROBERT W. NEAL, A.M.,	Box 708, Amherst.
Associate Professor of English.	
EDGAR L. ASHLEY, A.M.,	24 Pleasant Street.
Associate Professor of German.	
ALEXANDER A. MACKIMMIE, A.M.,	North Amherst.
Associate Professor of French.	
BURTON N. GATES, Ph.D.,	42 Lincoln Avenue.
Associate Professor of Beekeeping.	
JOHN A. McLEAN, ² A.B., B.Sc.Agr.,	- - -
Associate Professor of Animal Husbandry.	
CHARLES A. PETERS, Ph.D.,	2 South Sunset Avenue.
Associate Professor of Inorganic and Soil Chemistry.	
GEORGE E. GAGE, Ph.D.,	27 Sunset Avenue.
Associate Professor of Animal Pathology.	
CURRY S. HICKS, B.Pd.,	8 Allen Street.
Associate Professor of Physical Education and Hygiene.	
ERNEST ANDERSON, Ph.D.,	3 Phillips Street.
Associate Professor of General and Physical Chemistry.	
WALTER W. CHENOWETH, A.B., M.Sc.,	North Amherst.
Associate Professor of Pomology.	
F. H. HESSELINK VAN SUCHTELEN, Ph.D.,	30 North Prospect Street.
Associate Professor of Microbiology.	
ARNO H. NEHRING,	24 Pleasant Street.
Associate Professor of Floriculture.	
RALPH J. WATTS, B.Sc.,	10 Nutting Avenue.
Secretary of the College.	
CHARLES R. GREEN, B.Agr.,	Mount Pleasant.
Librarian.	
C. ROBERT DUNCAN, B.Sc., C.E.,	23 Lincoln Avenue.
Assistant Professor of Mathematics.	
ARTHUR K. HARRISON,	8 Allen Street.
Assistant Professor of Landscape Gardening.	
ELVIN L. QUALIFE, B.Sc.Agr.,	103 Butterfield Avenue.
Assistant Professor of Animal Husbandry.	
WILLIAM L. MACMER, A.M., M.E.,	3 Kendrick Place.
Assistant Professor of Mathematics.	
HENRY E. SMITH, A.M.,	24 Pleasant Street.
Assistant Professor of English.	

¹ Services began Jan. 1, 1916.² Resigned Sept. 30, 1915.

WALTER E. PRINCE, Ph.B., A.M.,	Kendrick Place.
Assistant Professor of English.	
HAROLD E. ROBBINS, B.Sc., A.M.,	12 Nutting Avenue.
Assistant Professor of Physics.	
PAUL J. ANDERSON, Ph.D.,	24 Pleasant Street.
Assistant Professor of Botany.	
EARL JONES, M.Sc.,	24 Pleasant Street.
Assistant Professor of Agronomy.	
CHARLES H. THOMPSON, M.Sc.,	77 South Pleasant Street.
Assistant Professor of Horticulture.	
ANDREW S. THOMSON, Ph.B.,	10½ Kellogg Avenue.
Assistant Professor of Market Gardening.	
ORVILLE A. JAMISON, B.Sc.,	7 East Pleasant Street.
Assistant Professor of Dairying.	
FRANK W. RANE, M.F.,	Boston.
Lecturer in Forestry.	
HELENA T. GOESSMANN, M.Ph.,	13 Main Street.
Instructor in English.	
WILLIAM L. HARMOUNT, A.B.,	86 Pleasant Street.
Instructor in French.	
ARTHUR N. JULIAN, A.B.,	Farview Way.
Instructor in German.	
FREDERICK A. McLAUGHLIN, B.Sc.,	24 Pleasant Street.
Instructor in Botany.	
SAMUEL COONS,	2 McClellan Street.
Instructor in Dairying.	
FRANK N. BLANCHARD, A.B.,	23 Lincoln Avenue.
Instructor in Zoology and Geology.	
LOYAL F. PAYNE, B.Sc.,	12 Chestnut Street.
Instructor in Poultry Husbandry.	
WILLIAM S. REGAN, Ph.D.,	6 Allen Street.
Instructor in Entomology.	
FRANK P. RAND, A.B.,	24 Pleasant Street.
Instructor in English.	
HAROLD E. BALDINGER, B.Sc.,	4 North Prospect Street.
Instructor in Dairying.	
WALTER M. PEACOCK, ¹ B.Sc.,	24 Pleasant Street.
Instructor in Farm Management.	
GLENN J. WIGHT, ² B.Sc.,	Lincoln Building, Main Street.
Instructor in Animal Husbandry.	
RAYMOND G. SMITH, B.Sc.,	Savings Bank Block.
Assistant in Botany.	
WILLIAM J. FITZMAURICE,	- - -
Assistant in Physical Education.	
HAROLD M. GORE, B.Sc.,	8 Allen Street.
Assistant in Physical Education.	
BURT A. HAZELTINE, B.Sc.,	4 North Prospect Street.
Assistant in Mathematics.	
ARAO ITANO, B.Sc.,	Lincoln Building, Main Street.
Assistant in Microbiology.	
PAUL SEREX, Jr., B.Sc.,	M. A. C.
Assistant in Chemistry.	
FREDERICK G. MERKLE, B.Sc.,	East Street.
Assistant in Agronomy.	
HARRY C. THOMPSON, B.Sc.,	16 North Prospect Street.
Assistant in Physics.	
FREDERICK W. READ, B.Sc.,	84 Pleasant Street.
Assistant in Agricultural Economics.	

¹ Services began Jan. 1, 1916.² Temporary appointment.

GRADUATE ASSISTANTS.

ROBERT P. ARMSTRONG, B.Sc., Department of Pomology, Experiment Station.	Phi Sigma Kappa House.
ROY C. AVERY, B.Sc., Department of Microbiology.	17 Phillips Street.
CHARLES G. BAIRD, A.M., Department of Rural Sociology.	23 Lincoln Avenue.
J. STANLEY COBB, B.Sc., Department of Agronomy.	5 Allen Street.
WILLIAM L. DORAN, B.Sc., Department of Botany.	Clark Hall.
ALEXANDER J. ERICHSON, B.Sc., Department of Chemistry.	4 North Prospect Street.
ERNEST E. FISH, B.Sc., Department of Animal Husbandry.	5 Allen Street.
EGERTON G. HOOD, B.Sc., Industrial Tests, Experiment Station.	15 Spring Street.
RUSSELL F. LUND, A.B., Department of Rural Sociology.	Pine Heights.
RALPH L. MACNEIL, B.Sc., Department of Chemistry.	M. A. C.
WILLIAM T. PAYNE, B.Sc., Industrial Tests, Experiment Station.	12 Chestnut Street.
GERALD E. PERRY, B.Sc., Department of Chemistry.	19 Amity Street.
ARTHUR W. PHILLIPS, B.Sc., Department of Chemistry.	4 North Prospect Street.
IRVING C. ROOT, B.Sc., Department of Landscape Gardening.	Mount Pleasant.
CARL J. STRAND, A.M., Department of Agricultural Economics.	75 Pleasant Street.
ARTHUR S. THURSTON, B.Sc., Department of Floriculture.	9 Fearing Street.
DONALD WHITE, B.Sc., Department of Poultry Husbandry, Experiment Station.	16 North Prospect Street.
STUART C. VINAL, B.Sc., Department of Entomology, Experiment Station.	112 Pleasant Street.

THE EXPERIMENT STATION STAFF.

ADMINISTRATION.

WILLIAM P. BROOKS, Ph.D., Director.	6 Farview Way.
JOSEPH B. LINDSEY, Ph.D., Vice-Director.	47 Lincoln Avenue.
FRED C. KENNEY, Treasurer.	Mount Pleasant.
CHARLES R. GREEN, B.Agr., Librarian.	Mount Pleasant.

DEPARTMENT OF AGRICULTURE.

WILLIAM P. BROOKS, Ph.D., Agriculturist.	6 Farview Way.
HENRY J. FRANKLIN, Ph.D., In charge of Cranberry Investigation.	Wareham.
EDWIN F. GASKILL, B.Sc., Assistant Agriculturist.	North Pleasant Street.
ROBERT L. COFFIN, Assistant.	Farview Way.

DEPARTMENT OF BOTANY AND VEGETABLE PATHOLOGY.

GEORGE E. STONE, ¹ Ph.D.,	Mount Pleasant.
Botanist and Plant Pathologist.	
GEORGE H. CHAPMAN, M.Sc.,	13 Fearing Street.
Assistant Botanist.	
ORTON L. CLARK, B.Sc.,	Mount Pleasant.
Assistant Botanist.	

DEPARTMENT OF ENTOMOLOGY.

HENRY T. FERNALD, Ph.D.,	44 Amity Street.
Entomologist.	
BURTON N. GATES, Ph.D.,	42 Lincoln Avenue.
Apiarist.	
ARTHUR I. BOURNE, A.B.,	12 East Pleasant Street.
Assistant Entomologist.	

DEPARTMENT OF PLANT AND ANIMAL CHEMISTRY.

JOSEPH B. LINDSEY, Ph.D.,	47 Lincoln Avenue.
Chemist.	
EDWARD B. HOLLAND, Ph.D.,	28 North Prospect Street.
Associate Chemist, in charge of Research Division.	
FRED W. MORSE, M.Sc.,	40 Pleasant Street.
Research Chemist.	
HENRI D. HASKINS, B.Sc.,	14 Amity Street.
In charge of Fertilizer Division.	
PHILIP H. SMITH, M.Sc.,	102 Main Street.
In charge of Feed and Dairy Division.	
LEWELL S. WALKER, B.Sc.,	19 Phillips Street.
Assistant.	
RUDOLPH W. RUPRECHT, ² M.Sc.,	- -
Assistant.	
CARLTON P. JONES, M.Sc.,	30 North Prospect Street.
Assistant.	
CARLOS L. BEALS, B.Sc.,	Kendrick Place.
Assistant.	
WALTER S. FROST, ³ B.Sc.,	- -
Assistant.	
CHARLES W. DAVIS, ⁴ B.Sc.,	Kappa Sigma House.
Assistant.	
JAMES P. BUCKLEY, Jr., B.Sc.,	29 Lincoln Avenue.
Assistant.	
JAMES T. HOWARD,	154 Main Street.
Collector.	
HARRY L. ALLEN,	89 Main Street.
Assistant.	
JAMES R. ALCOCK,	North Amherst.
Assistant.	

DEPARTMENT OF HORTICULTURE.

FRANK A. WAUGH, M.Sc.,	Campus.
Horticulturist.	
FRED C. SEARS, M.Sc.,	Mount Pleasant.
Pomologist.	
JACOB K. SHAW, Ph.D.,	1 Allen Street.
Research Pomologist.	

¹ On account of ill health not in administrative charge; Associate Professor Osmun acting as head of Department of Botany.

² Absent on leave; position filled temporarily by Mr. Norman H. Borden.

³ Resignation took effect Oct. 31, 1915.

⁴ Services began Dec. 1, 1915.

DEPARTMENT OF METEOROLOGY.

JOHN E. OSTRANDER, A.M., C.E., 33 North Prospect Street.
Meteorologist.

DEPARTMENT OF MICROBIOLOGY.

CHARLES E. MARSHALL, Ph.D., 44 Sunset Avenue.
In charge of Department.
F. H. HESSELINK VAN SUCHTELEN, Ph.D., 30 North Prospect Street.
Associate Professor of Microbiology.

DEPARTMENT OF POULTRY HUSBANDRY.

JOHN C. GRAHAM, B.Sc.Agr., Lincoln Avenue.
In charge of Department.
HUBERT D. GOODALE, Ph.D., North Amherst.
Research Biologist.

DEPARTMENT OF VETERINARY SCIENCE.

JAMES B. PAIGE, B.Sc., D.V.S., 42 Lincoln Avenue.
Veterinarian.
GEORGE E. GAGE, Ph.D., 27 Sunset Avenue.
Associate Professor of Animal Pathology.
BERYL H. PAIGE, A.B., 42 Lincoln Avenue.
Assistant in Veterinary Science.
ARNOLD P. STURTEVANT, A.B., 41 Lincoln Avenue.
Assistant in Veterinary Science.

THE EXTENSION SERVICE STAFF.

WILLIAM D. HURD, M.Agr., 46 Amity Street.
Director of the Extension Service and Supervisor of Short Courses.
EARNEST D. WARD, B.Sc.Agr., 61 Amity Street.
Assistant Director.
SUMNER R. PARKER,¹ B.Sc., 41 Amity Street.
Assistant State Leader and Extension Professor of Rural Organization.
ORION A. MORTON, Lincoln Avenue.
Extension Professor of Agricultural Education.
EZRA L. MORGAN, A.M., 2 Allen Street.
Extension Professor of Community Planning.
LAURA COMSTOCK, 84 Pleasant Street.
Extension Professor of Home Economics.
RICHARD H. FERGUSON,² B.Sc.Agr., - -
Extension Professor of Agricultural Economics.
E. FARNAM DAMON,³ B.Sc., - -
Extension Associate Professor of Agricultural Economics.
RALPH W. REES, A.B., B.Sc., 24 Pleasant Street.
Extension Instructor in Pomology.
FRANK A. C. SMITH,³ B.Sc., - -
Extension Instructor in Civic Improvement.
ERWIN H. FORBUSH, 8 Nutting Avenue.
Supervisor of Correspondence Courses.
ETHEL H. NASH, 16 Nutting Avenue.
Extension Instructor in Agricultural Education.
BENJAMIN W. ELLIS,⁴ B.Sc., - -
Assistant State Leader.
HARRIET J. HOPKINS,⁵ B.Sc., - -
Extension Instructor in Home Economics.

¹ Services began Dec. 6, 1915.² Died Dec. 1, 1915.³ Services began Feb. -, 1916.⁴ Resignation took effect Dec. 31, 1915.⁵ Resignation took effect Oct. 6, 1915.

ALFRED G. LUNN, B.Sc.,	North Amherst.
Extension Instructor in Poultry Husbandry.	
ERIC N. BOLAND, M.Sc.,	13 Fearing Street.
Extension Instructor in charge of Boys' and Girls' Pig Club Work.	
MARIE SAYLES, ¹ B.Sc.,	79 Pleasant Street.
Extension Instructor in Home Economics.	
WESLEY H. BRONSON, B.Sc.,	Lincoln Block.
Extension Instructor in Farm Demonstrations.	
WILLIAM F. TURNER, ² B.Sc.,	- -
Extension Instructor in Animal Husbandry.	

THE CLERICAL STAFF.

ELBERT L. ARNOLD, ³	Northampton.
Chief Clerk, Extension Service.	
CLARISSA G. BABCOCK, ⁴	- -
Library Assistant.	
ELEANOR BARKER, ⁵	9 Phillips Street.
Clerk, Department of Floriculture.	
ELEANOR F. BISHOP,	3 Spaulding Street.
Clerk, Treasurer's Office.	
FRANCES C. BOYNTON, A.B.,	10 Hallock Street.
Clerk, Department of Farm Administration.	
JOHN K. BROADFOOT,	7½ East Pleasant Street.
Cashier, Treasurer's Office.	
BERTHA A. BROCKHAUS, ⁶	- -
Clerk, President's Office.	
ANNE BUTLER, ⁷	- -
Assistant in Library.	
MABEL R. CASE, ⁸ A.B.,	- -
First Clerk, Extension Service.	
ADA M. CHANDLER, A.B.,	3 Fearing Street.
Cataloguer, Library.	
LENA V. CHAPMAN,	77 South Pleasant Street.
Library Assistant.	
LUCIA G. CHURCH,	North Amherst.
First Clerk, Experiment Station.	
PHYLLIS J. COGSWELL,	79 Pleasant Street.
Stenographer, Department of Agricultural Education.	
JESSIE V. CROCKER,	Sunderland.
Clerk, Department of Botany.	
MARCELLA P. CURRY, B.Sc.,	Draper Hall.
Clerk, Department of Poultry Husbandry.	
LOUISE G. DAVIDSON, ⁹	7 Northampton Road.
Telephone Operator, Stockbridge Hall.	
F. ETHEL FELTON, ¹⁰	8 Allen Street.
Clerk, Director's Office, Experiment Station.	
LINA E. FISHER,	28 Pleasant Street.
Clerk, Department of Chemistry.	
GRACE E. GALLOND,	28 Pleasant Street.
Clerk, Department of Dairying.	
LILLIAN M. GELINAS,	77 Pleasant Street.
Clerk, President's Office.	
ALICE M. GILBERT,	9 Phillips Street.
First Clerk, Division of Agriculture.	
HANNAH M. GRIFFIN, A.B.,	9 Phillips Street.
Clerk, Department of Farm Administration.	

¹ Services began Sept. 16, 1915.² Services began Dec. 8, 1915.³ Services began Jan. 14, 1916.⁴ Resignation took effect Sept. 30, 1915.⁵ Services began Dec. 13, 1915.⁶ Resignation took effect Dec. 31, 1915.⁷ Services began Oct. 18, 1915; resignation took effect Nov. 13, 1915.⁸ Resignation took effect Jan. 31, 1916.⁹ Services began Nov. 15, 1915.¹⁰ Services began Nov. 1, 1915.

CORA B. GROVER,	North Amherst.
Clerk, Director's Office, Extension Service.	
MARION GUERTIN,	20 Pleasant Street.
Stenographer, Department of Beekeeping.	
LILLIAN S. HADFIELD,	9 Phillips Street.
Clerk, Extension Service.	
LAURA W. HAGER, ¹ A.B.,	Deerfield.
Clerk, Department of Agricultural Economics.	
MARY E. HORTON,	15 Fearing Street.
Clerk, Department of Rural Social Science.	
ESTHER L. HOUGHTON, A.B.,	Draper Hall.
Clerk, Department of Microbiology.	
ALICE M. HOWARD,	North Amherst.
First Clerk, Experiment Station.	
LORIAN P. JEFFERSON, A.M.,	84 Pleasant Street.
Research Secretary, Division of Rural Social Science.	
HELENA KEIBER,	56 Pleasant Street.
Stenographer, Extension Service.	
IRENE A. MARTIN, ²	East Street.
Stenographer, Treasurer's Office.	
REBECCA L. MELLOR,	10 Kellogg Avenue.
Clerk, Experiment Station.	
NELL C. MILTON,	Draper Hall.
Stenographer, Division of Rural Social Science.	
ELIZABETH E. MOONEY,	Draper Hall.
Stenographer, Department of Poultry Husbandry.	
BRIDIE E. O'DONNELL,	Hadley.
Clerk, Department of Entomology.	
HELEN C. POMEROY,	Draper Hall.
Stenographer, Division of Horticulture.	
VIVIAN ROY, ³	5 McClellan Street.
Library Assistant.	
GLADYS E. RUSSELL, A.B.,	9 Phillips Street.
Clerk, Division of Horticulture.	
EDNA M. SANDERS,	Hadley.
Bookkeeper, Treasurer's Office.	
MARY I. SHORES,	10 Woodside Avenue.
Clerk, Dean's Office.	
ELSA SLATTERY,	Northampton.
Stenographer, Extension Service.	
DOROTHY F. SMITH, ⁴	- -
Clerk, Department of Floriculture.	
HARRIET C. STEVENSON, ⁵	- -
Stenographer, Department of Agricultural Economics.	
ETHEL M. TURNER, ⁶	55 Pleasant Street.
Library Assistant.	
OLIVE M. TURNER, B.Sc.,	22 Spaulding Street.
Clerk, Registrar's Office.	
DOROTHY M. TYACKE, ⁷	- -
Stenographer, Treasurer's Office.	
HENRIETTA J. WEBSTER,	Draper Hall.
First Clerk, Treasurer's Office.	
AURELIA B. WENTWORTH,	South Amherst.
Stenographer, Division of Agriculture.	

¹ Services began Dec. 1, 1915.² Services began Oct. 26, 1915.³ Services began Nov. 29, 1915.⁴ Resignation took effect Dec. 10, 1915.⁵ Resignation took effect Sept. 9, 1915.⁶ Services began Nov. 26, 1915.⁷ Resignation took effect Oct. 26, 1915.

STAFF OF OPERATING AND MAINTENANCE.

JOHN J. BARBER,	Campus.
Farm Superintendent.	
THOMAS BUTTERWORTH,	6 Phillips Street.
Assistant Engineer.	
JOHN L. BYARD,	21 Pleasant Street.
Superintendent of the Apiary.	
WILLIAM CHESLEY,	Draper Hall.
Steward of the Dining Hall.	
LAWRENCE S. DICKINSON, B.Se.,	2 Farview Way.
Superintendent of Grounds.	
CLARENCE A. JEWETT,	112 Pleasant Street.
Superintendent of Buildings.	
JOHN J. LEE,	38 Cottage Street.
Assistant to the Military Detail.	
FLORENCE LEVENSALER,	Infirmery.
Resident Nurse.	
ALEXANDER SMART, ¹	East Pleasant Street.
Assistant to the Commandant.	
NEWTON WALLACE,	Campus.
Electrician.	
JAMES WHITING,	16 Hallock Street.
Foreman, Department of Floriculture.	

¹ Services began Nov. 2, 1915.

STANDING COMMITTEES OF THE FACULTY.

1915-16.

CATALOGUE AND OTHER PUBLICATIONS.

Associate Professor NEAL.
Assistant Professor SMITH.
Secretary WATTS.

COMMENCEMENT.

Professor PAIGE.
Treasurer KENNEY.
Lieutenant FLEET.
Associate Professor PETERS.
Associate Professor NEHRLING.
Assistant Professor DUNCAN.
Secretary WATTS.

COURSE OF STUDY.

President BUTTERFIELD.
Dean LEWIS.
Professor HART.
Professor WAUGH.
Professor FOORD.
Professor SPRAGUE.
Professor FERNALD.
Professor OSTRANDER.
Professor MARSHALL.
Professor CHAMBERLAIN.
Professor CANCE.
Associate Professor CHENOWETH.

DISCIPLINE (ADVISORY).

Dean LEWIS.
Professor HASBROUCK.
Associate Professor HICKS.
Associate Professor MACKIMMIE.
Assistant Professor MACHMER.

EMPLOYMENT.

Professor SEARS.
Dean LEWIS.
Treasurer KENNEY.
Professor HASKELL.

ENTRANCE EXAMINATIONS AND ADMISSION.

Registrar HASBROUCK.

Dean LEWIS.

Associate Professor OSMUN.

Associate Professor E. ANDERSON.

Associate Professor ASHLEY.

Assistant Professor MACHMER.

HEALTH AND SANITATION.

Professor MARSHALL.

Treasurer KENNEY.

Lieutenant FLEET.

Professor LOCKWOOD.

Miss COMSTOCK.

Associate Professor HICKS.

LIBRARY.

Professor MARSHALL.

Professor SPRAGUE.

Professor GUNNESS.

Assistant Professor A. S. THOMSON.

Mr. GREEN.

SCHEDULE.

Professor LOCKWOOD.

Associate Professor PETERS.

Assistant Professor DUNCAN.

SCHOLARSHIP.

Dean LEWIS.

Registrar HASBROUCK.

Associate Professor GORDON.

Associate Professor MACKIMMIE.

Assistant Professor HARRISON.

Assistant Professor MACHMER.

STUDENT LIFE.

President BUTTERFIELD.

Dean LEWIS.

Treasurer KENNEY.

Director HURD.

Professor CHAMBERLAIN.

Professor SPRAGUE.

Professor HART.

Professor HASKELL.

Professor CRAMPTON.

Professor PHELAN.

Professor LOCKWOOD.

Associate Professor E. ANDERSON.

Associate Professor MACKIMMIE.

Associate Professor HICKS.

Secretary WATTS.

Assistant Professor QUAIPE.

Assistant Professor MACHMER.

Assistant Professor A. S. THOMSON.

Assistant Professor ROBBINS.

UNCLASSIFIED STUDENTS.

Dean LEWIS.

Registrar HASBROUCK.

Professor SEARS.

Professor HASKELL.

APPOINTED TO ATHLETIC BOARD.

Dean LEWIS.

Registrar HASBROUCK.

Associate Professor OSMUN.

APPOINTED TO NONATHLETIC BOARD.

Professor LOCKWOOD.

Assistant Professor MACHMER.

THE COLLEGE.

ADMISSION.

A. APPLICATION FOR ADMISSION.

All correspondence concerning admission should be addressed to the registrar.

Every applicant for admission to the college must be at least sixteen years old, and must present to the registrar proper testimonials of good character. Such testimonials, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before examination is desired. Blanks for such application may be obtained by addressing the registrar of the college. All entrance credentials must be in the hands of the registrar before the applicant can matriculate.

B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

CERTIFICATES. — Certificates will be received from those schools in New England which have been approved by the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England may be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject.

Certificates in order to be accepted must present at least three of the necessary fourteen credits. It is to be understood, however, that responsibility for certification in either elementary French, elementary German, English 1 or English 2, Latin A, Greek A or algebra must be assumed by one school, if the candidate has received his preparation in any one subject named above in more than one school. Subjects lacking on certificate (except for the permitted number of conditions) must be made up at the time of the examinations for admission.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the registrar of the college.

EXAMINATIONS. — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 65 per cent. Conditions to the amount of two units will be allowed.

Entrance examination for admission to the Massachusetts Agricultural College will be held at the following centers:—

In June, Amherst, Department of Physics building.
Boston, College of Liberal Arts, Boston
University.
Worcester, Horticultural Hall.

In September, Amherst, Department of Physics building.

Please note that September examinations are held in Amherst only.

Schedule for Entrance Examinations, June 22-24, inclusive, 1916.—The examinations in June will follow this schedule:—

First Day.

7.45 A.M. Registration.¹
8.00 A.M. Plane geometry.
10.00 A.M. Chemistry.
11.30 A.M. Botany.
2.00 P.M. Solid geometry.
4.00 P.M. Physics.

Second Day.

8.00 A.M. Required English.
11.00 A.M. Algebra.
2.00 P.M. History, required and elective.

Third Day.

8.00 A.M. French, German, required and elective.
1.00 P.M. Latin A and B and all one-half credit electives, except those already noted.

Schedule for Entrance Examinations in September.—In September, 1916, the examinations will be given September 13 to 16, inclusive, and will follow the order indicated below:—

First Day.

1.00 P.M. Registration.
1.15-5.00 P.M. Greek A and B.

Second Day.

8.00 A.M. Plane geometry.
10.00 A.M. Chemistry.
11.30 A.M. Botany.
2.00 P.M. Solid geometry.
4.00 P.M. Physics.
5.00 P.M. Elective English.

Third Day.

8.00 A.M. Required English.
11.00 A.M. Algebra, agriculture.
2.00 P.M. History, required and elective.

Fourth Day.

8.00 A.M. French, German, required and elective.
1.00 P.M. Latin A and B and all one-half credit electives, except those already noted.

¹ Candidates who have no examination at the time set for registration may register at the time of their first examination should they so desire.

C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-year high school course, or its equivalent, and are stated in terms of units. The term unit means the equivalent of at least four recitations a week for a school year. **Neither more nor less credit will be given in any subject than is indicated in the table below.** Fourteen units must be offered for admission. In the list given below, *every subject in black-faced type is absolutely required and no substitution is allowed.* The subjects so typed total eight and one-half units. In addition to these points five and one-half more units must be chosen from the subjects printed in light-faced type. Not more than four half-credit units may be offered. No applicant deficient in both algebra and plane geometry will be admitted.

Agriculture, ¹	½ or 1
Botany, ²	½ or 1
Chemistry, ²	1
Algebra,	1½
Plane geometry,	1
Solid geometry,	½
Trigonometry,	½
Physics, ²	1
Geology,	½
Physiography,	½
Physiology,	½
Zoology, ²	½
History³ (Ancient; Medieval and Modern; English; General; United States and Civics), any one,	1 ⁴
English 1,	1½
English 2,	1½
Modern Language (elementary French or elementary German),	2
Elementary French, ⁵	2
Elementary German, ⁵	2
Intermediate French,	1
Advanced French,	1
Intermediate German,	1
Advanced German,	1
Greek A, ¹	2
Greek B, ¹	1
Latin A,	2
Latin B,	1
Commercial geography, ⁶	½
Drawing, ⁶	½
Manual training, ⁶	½ or 1

PRESENTATION OF NOTE-BOOKS. — The keeping of a note-book is required as part of the preparation in those subjects indicated (see note 2, below).

Candidates presenting themselves for examination in such subjects must present at the same time the required note-book, properly certified by the principal. Candidates presenting such subjects on certificates should not present note-books; but their certificates must state that note-books have been satisfactorily completed.

¹ Examination in September only.

² Note-book required as part of preparation will be credited as part of the examination.

³ One must be offered for the required point; one, two or three others may be offered for elective points.

⁴ For each offered.

⁵ May be offered as elective if not offered to satisfy *required* points.

⁶ On certificate only, no examination given.

D. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE. — Owing to the wide divergence of the methods of teaching agriculture in the public schools, the student will be required to bring a statement from the principal of the amount and kinds of work accomplished and of the text-books used. The examination will be based somewhat upon this information; but it will call for not less than one-half year of creditable work of high school grade. **The examination in agriculture will be given in September only.**

BOTANY. — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary text-book study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Steven's "Introduction to Botany" and Bergen and Davis's "Principles of Botany." A note-book containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this note-book must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY. — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from such text-books as Newell's "Descriptive Chemistry" or Remsen's "Elements of Chemistry," with laboratory work on the general properties of the common elements, some of the experiments being quantitative. The keeping of a note-book is required.

MATHEMATICS. — (a) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(b) *Elective.* — Solid Geometry: The usual theorems and constructions of good text-books, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the

sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

Plane Trigonometry: A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

PHYSICS. — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both class-room work and laboratory practice. The work covered in the class-room should be equal to that outlined in Hall & Bergen's "Text-book of Physics" or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory note-book. This note-book, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination paper submitted. Candidates entering on certificate will not be required to present note-books, but the principal's certification must cover laboratory as well as class-room work.

PHYSIOLOGY. — Hough & Sedgwick's "The Human Mechanism;" Martin's "The Human Body; Briefer Course."

ZOOLOGY, PHYSIOGRAPHY, GEOLOGY. — The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis' "Elementary Physical Geography;" Gilbert & Brigham's "Introduction to Physical Geography." For zoölogy, text-books entitled "Animals" or "Animal Studies," by Jordan, Kellogg and Heath; Linville & Kelley's "A Text-book in General Zoölogy." For geology, A. P. Brigham's "A Text-book of Geology" or Tarr's "Elementary Geology."

Applicants for examination in zoölogy are *required* to present certified laboratory note-books; applicants for examination in the other subjects are *advised* to present note-books, if laboratory work has been done. Good note-books may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

HISTORY. — The required unit must be offered in either ancient history, medieval and modern history, English history, general history, or United States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good text-books, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the text-book work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval his-

tory; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

ENGLISH. — For 1916-19 inclusive: —

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence and appreciation.

(1) *Grammar and Composition* (One and One-half Units). — The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

(2) *Literature*. — The second object is sought by means of two lists of books, headed, respectively, "Reading" and "Study," from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud and encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. *Reading* (One and One-half Units). — The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.: —

Group I. Classics in Translation: The "Old Testament," comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther; the "Odyssey," with the omission, if desired, of Books I., II., III., IV., V., XV., XVI., XVII.; the "Iliad," with the omission, if desired, of Books XI., XIII., XIV., XV., XVIII., XXI.; the "Æneid." The "Odyssey," "Iliad" and "Æneid" should be read in English translations of recognized literary excellence.

For any selection from Group I. a selection from any other group may be substituted.

Group II. Shakspeare: "Midsummer Night's Dream;" "Merchant of Venice;" "As You Like It;" "Twelfth Night;" "The Tempest;" "Romeo

and Juliet;" "King John;" "Richard II.;" "Richard III.;" "Henry V.;" "Coriolanus;" "Julius Cæsar;"¹ "Macbeth;"¹ "Hamlet."¹

Group III. Prose Fiction: Malory's "Morte d'Arthur" (about 100 pages); Bunyan's "Pilgrim's Progress," Part I.; Swift's "Gulliver's Travels" (voyages to Lilliput and to Brobdingnag); Defoe's "Robinson Crusoe," Part I.; Goldsmith's "Vicar of Wakefield;" Frances Burney's "Evelina;" Scott's novels, any *one*; Jane Austen's novels, any *one*; Maria Edgeworth's "Castle Rackrent" or "The Absentee;" Dickens' novels, any *one*; Thackeray's novels, any *one*; George Eliot's novels, any *one*; Mrs Gaskell's "Cranford;" Kingsley's "Westward Ho!" or "Hereward the Wake;" Reade's "The Cloister and the Hearth;" Blackmore's "Lorna Doone;" Hughes's "Tom Brown's School Days;" Stevenson's "Treasure Island" or "Kidnapped" or "Master of Ballantrae;" Cooper's novels, any *one*; Poe's "Selected Tales;" Hawthorne's "The House of the Seven Gables" or "Twice Told Tales" or "Mosses from an Old Manse;" a collection of short stories by various standard writers.

Group IV. Essays, Biography, etc.: Addison and Steele's "The Sir Roger de Coverley Papers" or selections from the "Tatler" and "Spectator" (about 200 pages); selections from Boswell's "Life of Johnson" (about 200 pages); Franklin's "Autobiography;" selections from Irving's "Sketch Book" (about 200 pages) or "Life of Goldsmith;" Southey's "Life of Nelson;" selections from Lamb's "Essays of Elia" (about 100 pages); selections from Lockhart's "Life of Scott" (about 200 pages); Thackeray's "Lectures on Swift, Addison and Steele in the English Humorists;" Macaulay: any one of the following essays: "Lord Clive," "Warren Hastings," "Milton," "Addison," "Goldsmith," "Frederic the Great," "Madame d'Arblay;" selections from Trevelyan's "Life of Macaulay" (about 200 pages); Ruskin's "Sesame and Lilies" or "Selections" (about 150 pages); Dana's "Two Years before the Mast;" Lincoln's "Selections," including at least the two inaugurals, the speeches in Independence Hall and at Gettysburg, the last public address, the letter to Horace Greeley, together with a brief memoir or estimate of Lincoln; Parkman's "The Oregon Trail;" Thoreau's "Walden;" Lowell's "Selected Essays" (about 150 pages); Holmes's "The Autocrat of the Breakfast Table;" Stevenson's "An Inland Voyage" and "Travels with a Donkey;" Huxley's "Autobiography" and selections from "Lay Sermons," including the addresses on "Improving Natural Knowledge," "A Liberal Education" and "A Piece of Chalk;" a collection of "Essays" by Bacon, Lamb, De Quincey, Hazlitt, Emerson and later writers; a collection of "Letters" by various standard writers.

Group V. Poetry: Palgrave's "Golden Treasury" (first series), Books II. and III., with special attention to Dryden, Collins, Gray, Cowper and Burns; Palgrave's "Golden Treasury" (first series), Book IV., with special attention to Wordsworth, Keats and Shelley (if not chosen for study under B); Goldsmith's "The Traveller" and "The Deserted Village;" Pope's "The Rape of the Lock;" a collection of English and Scottish ballads, as, for example, some "Robin Hood" ballads, "The Battle of Otterburn," "King Estmere," "Young Beichan," "Bewick and Grahame," "Sir Patrick Spens" and a selection from later ballads; Coleridge's "The Ancient Mariner," "Christabel" and "Kubla Khan;" Byron's "Childe Harold," Canto III. or IV., and "The Prisoner of Chillon;" Scott's "The Lady of the Lake" or "Marmion;" Macaulay's "The Lays of Ancient Rome," "The Battle of Naseby," "The

¹ If not chosen for study under B.

Armada," "Ivry," Tennyson's "The Princess" or "Gareth and Lynette," "Lancelot and Elaine" and "The Passing of Arthur," Browning's "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "Hervé Riel," "Pheidippides," "My Last Duchess," "Up at a Villa — Down in the City," "The Italian in England," "The Patriot," "The Pied Piper," "De Gustibus," "Instans Tyrannus," Arnold's "Sohrab and Rustum" and "The Forsaken Merman," selections from American poetry, with special attention to Poe, Lowell, Longfellow and Whittier.

B. Study. — This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I. Drama: Shakspeare's "Julius Cæsar," "Macbeth," "Hamlet."

Group II. Poetry: Milton's "L'Allegro," "Il Penseroso" and either "Comus" or "Lycidas," Tennyson's "The Coming of Arthur," "The Holy Grail" and "The Passing of Arthur," the selections from Wordsworth, Keats and Shelley in Book IV. of Palgrave's "Golden Treasury" (first series).

Group III. Oratory: Burke's "Speech on Conciliation with America," Macaulay's "Speech on Copyright" and Lincoln's "Speech at Cooper Union," Washington's "Farewell Address" and Webster's "First Bunker Hill Oration."

Group IV. Essays: Carlyle's "Essay on Burns," with a selection from Burns's "Poems," Macaulay's "Life of Johnson," Emerson's "Essay on Manners."

Examination. — However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include: —

(a) General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under "A, Reading," above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

(b) A test on the books prescribed for study, which will consist of questions

upon their content, form and structure, and upon the meaning of such words, phrases and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works and the periods of literary history to which they belong.

ENGLISH, ELECTIVE. — To secure a fourth entrance credit in English the applicant must have done, in addition to the requirements stated above, work equivalent to a course meeting at least four times a week for one year. Applicants not certified with this fourth entrance credit will be examined in September, provided that they notify the Department of English of their desire on or before June 1. **(The examination in English elective will be given in September only. After September, 1916, the maximum credits accepted in English, either by certificate or by examination, will be three.)**

Subjects accepted. — Applicants may offer (a) any one of the subjects stated hereunder, or (b) any two of these subjects in combination.

- (a) History of American literature.
- (b) History of English literature.
- (c) Classics *other than those read to meet the three-credit requirement.*
- (d) Advanced composition.
- (e) History of the English language.
- (f) Advanced high school grammar.

FRENCH. — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third credit unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth credit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

GERMAN. — Elementary: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third credit unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth credit in German will be given unless the candidate has presented both elementary and intermediate German upon

certificate, or has written the examination for both elementary and intermediate German.

GREEK. — Greek will receive credit as an elective requirement upon either examination or certification, as follows. **(The examination in Greek A and Greek B will be given in September only.)**

A. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from the first four books of Xenophon's "Anabasis," and (b) the translation of passages of Attic prose at sight.

B. A third credit unit will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages from the first six books of Homer's "Iliad," and (b) translation of passages of Homer's "Iliad" at sight, with questions on the form and constructions of the passages.

LATIN. — Latin will receive credit as an elective requirement upon either examination or certification, as follows: —

A. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from Cæsar's "Gallic War," covering at least four books, and (b) the translation of passages of Latin prose at sight.

B. A third credit unit will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages selected from either Books I. to VI. of Virgil's "Æneid," or six orations of Cicero, including those against Catiline; and (b) the translation into Latin prose of a passage of connected English narrative based on some portion of Cæsar's "Gallic War," Books I. to IV.

COMMERCIAL GEOGRAPHY.¹ — Preparation should be made in a course equivalent to that laid down in Adams' "Commercial Geography," Trotter's "Geography of Commerce," or a similar work. (No examination given.)

DRAWING.¹ — The applicant may offer either freehand or mechanical drawing or both. He must be able to make an accurate freehand sketch, in either outline or light and shade, of the appearance of a group of geometric solids, and have a sufficient knowledge of perspective to enable him to draw correctly a simple geometric model from memory; or, if he present mechanical drawing, he must have working familiarity with drawing instruments, and be able to make an accurate inked working drawing, in orthographic projection, of some simple object. Emphasis is laid on facility in doing good freehand lettering. For a limitation of the work that may be presented, see "Manual Training." (No examination given.)

MANUAL TRAINING.¹ — An entrance credit of one-half or one unit is allowed for manual training, on the presentation of a certificate from the principal of the school showing the scope and character of the applicant's work. The preparation may include mechanical drawing, working in wood, metals, leather, etc. When mechanical drawing is presented as a part of the work in manual training, no other credit for drawing will be allowed. No examination is given in this subject; applicants must present certificates to secure credit.

¹ On certificate only; no examination given.

E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this college from another college or university of recognized standing must present the following credentials:—

1. A letter of honorable dismissal from the institution with which he has been connected.

2. A statement or certificate of his entrance record.

3. A statement from the proper officer showing a complete record of his work while in attendance.

4. A marked catalogue showing the courses pursued.

These credentials should be presented to the registrar. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)

2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.

3. Candidates must receive credit for twelve units out of the total number required for entrance, and will be conditioned in those subjects not passed. Not more than five and one-half credits from the elective group will be accepted. No candidate deficient in both algebra and plane geometry will be admitted.

4. Examinations for the removal of entrance conditions will be held as follows: (1) First entrance condition examination, in the week following the Thanksgiving recess. (2) Second entrance condition examination, in the sixteenth week of the first semester.

5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.

6. Examinations in part of the subjects required for entrance may be taken one year before entering college.

7. For information concerning expenses, scholarships, etc., see "General Information."

8. For information concerning admission to short courses see "Short Courses."

G. UNCLASSIFIED STUDENTS.

All requests for information concerning admission of unclassified students should be addressed to Dean Edward M. Lewis, chairman of committee on unclassified students.

Students not candidates for a degree (unclassified students) are admitted under the following provisions:—

1. No entrance examination is required, but applicants must bring certificates showing that they have finished a four-year high school course or its equivalent, and furnish satisfactory testimonials as to moral character.

2. No applicant under twenty-one years of age will be admitted as an unclassified student.

3. Each unclassified student must take from the regular courses a minimum of twelve credit hours a week.

4. In order to be admitted to any course, an unclassified student must have had all prerequisite subjects for that course.

5. Every unclassified student must do all the work of the courses elected, and take all examinations therein. In order to pass such courses he must attain a grade of at least 75 per cent. An unclassified student who passes in less than two-thirds of his work will be dropped from college.

6. All unclassified students are subject to the supervision of a special committee.

7. Any unclassified student may be dropped from college at any time if his presence in any class is undesirable or his work is unsatisfactory; and no unclassified student will be allowed to remain in college more than four semesters without the special permission of the faculty.

8. Unclassified students are subject to the regulations applying to classified students.

9. No student of this or any other institution who has not done efficient work therein shall be permitted to register as an unclassified student.

10. No unclassified student shall be allowed to participate in any inter-collegiate contests.

COURSES OF INSTRUCTION.

A. TABLE OF FRESHMAN AND SOPHOMORE SUBJECTS.

The figures indicate the number of credit hours a week. For details, see the descriptions of courses.

FRESHMAN YEAR.

First Semester.

All work required.

Subjects.	Hours per Week.
Chemistry,	3
Algebra,	3
Solid geometry, ¹	2
English,	4
Public speaking (at option of instructor),	1
French or German, ²	4
Drill,	1
Hygiene,	1
College life (attendance without credit).	

18 or 19

Second Semester.

All work required.

Subjects.	Hours per Week.
Animal husbandry,	2
Chemistry,	3
Trigonometry,	3
Algebra,	2
English,	4
Public speaking (if not taken in semester one),	1
French or German,	4
Drill,	1
Physical education,	1

20 or 21

¹ To be taken in course when not offered for entrance.

² Students who have had three or four years of one language in the preparatory school will elect the other language. Students who have had two years of one language may have their choice of election. Whichever language they so elect must be continued to the end of the first semester of the sophomore year. Eleven college credits are required in this language.

SOPHOMORE YEAR.

First Semester.

All work required except chemistry or animal husbandry.

Subjects.	Hours per Week.
Agronomy,	3
Physics,	5
Zoölogy,	3
English,	2
French or German,	3
Tactics,	1
Drill,	1
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[Chemistry or animal husbandry (may be elected subject to approval by the dean),]	3]
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	[21]

Second Semester.¹

Subjects.	Required.	Hours per Week.
Elementary horticulture,		2
Botany,		4
English,		2
Agricultural industry,		3
Drill,		1
Tactics,		1
Physical education,		1
		<hr/>
		14
	Elective.	
French or German,	Each 3 hours. Any two,	6
Geology,		
Physics,		
Chemistry,		
Surveying,		
		<hr/>
		20

The following table shows the course of study which it is intended will be in effect with the entrance of the class of 1920:—

FRESHMAN YEAR.

<i>First Semester.</i>		<i>Second Semester.</i>	
English and public speaking,	4 or 3	English and public speaking,	4 or 3
Algebra,	3	Trigonometry,	3
Geometry,	2	Algebra,	2
Chemistry,	3	Chemistry,	3
Drill, etc., 2; military tactics, 1,	3	Drill, etc., 2; military tactics, 1,	3
Language,	3	Agricultural geology,	3
Agriculture and horticulture,	2	Language,	3
	<hr/>	Agriculture and horticulture,	2
	20 or 19		<hr/>
			23 or 22

¹ All courses under "Required," with any two of those under "Elective."

SOPHOMORE YEAR.

<i>First Semester.</i>					<i>Second Semester.</i>				
Physics,	4	Agronomy,	3		English,	2			
English,	2	English,	2		Botany,	4			
Zoölogy,	3	Botany,	4		Drill, etc.,	2			
Rural community,	2	Drill, etc.,	2		Agricultural industry,	3			
Drill, etc.,	2	Agricultural industry,	3		2 or 3 electives,	6 or 9			
2 or 3 electives,	6 or 9	2 or 3 electives,	6 or 9						
	19 to 22								
<i>Electives (subject to Revision).</i>					<i>Electives (subject to Revision).</i>				
Language,	3	Language,	3		Agriculture (?),	3			
Mathematics,	3	Agriculture (?),	3		Chemistry,	3			
Agriculture,	3	Chemistry,	3		Entomology,	4			
Chemistry,	3	Entomology,	4		Geology,	3			
Free-hand drawing,	3	Geology,	3		Surveying,	3			
Anthropology,	3	Surveying,	3		Horticulture,	3			
		Horticulture,	3		Physics,	4			
		Physics,	4		Zoölogy,	3			
		Zoölogy,	3		Agricultural education (?),	3			
		Agricultural education (?),	3		Mechanical drawing,	3			
		Mechanical drawing,	3						

FOUR TERM PLAN.

The faculty and the trustees have approved a plan whereby, beginning September, 1916, the college year will be divided into four terms, including a summer session. It is expected that by offering work in the practical departments during the summer months a more adequate training will be assured to the students. The plan contemplates no marked changes in the content or character of the various courses of study described in this catalogue. The adaptation of these courses to the new division of the year is now being made, and a detailed statement relative to the readjustment will be published in April or May, 1916. A copy of this bulletin may be had on application.

B. MAJORS: JUNIOR AND SENIOR YEARS.

GENERAL STATEMENT.

A major consists of 30 hours of correlated work, to be arranged by the student and an instructor called the adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average man majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

RULES GOVERNING MAJORS.

RULE 1. *Election*. — Each student, in the second semester of his sophomore year, shall elect a major subject from the list of majors given below; and this major shall consist of 30 credit hours of correlated work.

RULE 2. *Minimum Credits*. — The minimum number of credits for the junior and senior years shall be 65, inclusive of military drill and physical education.

RULE 3. *Maximum Credits*. — The maximum number of credits for any semester of the junior or senior year shall be 21.

RULE 4. *Humanities and Rural Social Science*. — A minimum of 12 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: that a minimum of 3 credit hours will be required in each of the divisions.

RULE 5. *Advisers*. — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student intends to elect his major. Each student should consult with the adviser as soon as possible. The adviser has full authority to prescribe the student's work up to 30 hours. It is understood, however, that so far as practicable the individual needs of the student will be recognized. It is also hoped and expected that students will be disposed to seek the counsel of the adviser with respect to the remaining courses required for graduation.

RULE 6. *Free Electives*. — Each student is required to take 30 hours in his major and also 12 hours in the Divisions of the Humanities and Rural Social Science, making a total of 42 hours. He is allowed free choice of courses to complete his required hours, this remainder amounting to 17 hours minimum, or 37 hours maximum for the two years.

RULE 7. *Registration*. — No upper classman shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the registrar's office on June 1.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the year and countersign the card.

(3) Each course card must be filled out, giving the name of student, his college address, the name of parent or guardian, and the student's home address. When the major courses have been entered on this card, and the hours of free elections added by the student, the card must be returned to the registrar not later than June 10.

RULE 8. Changes. — Applications for changes may be made to the dean in writing at any time; when approved by him and by the committee on scholarship, they become operative at the beginning of the semester following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

LIST OF MAJORS IN THE DIVISION OF AGRICULTURE.

Agriculture.

Professor JAMES A. FOORD, Adviser.

Course.	Credit.
Agronomy 3,	3
Agronomy 6,	3
Animal Husbandry 3,	3
Animal Husbandry 5,	3
Animal Husbandry 9,	3
Dairying 1,	3
Dairying 2,	3
Farm Administration 3,	3
Farm Administration 4,	3
Microbiology 1 and 2,	5
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Chemistry 7 and 8, Veterinary Science 1, Microbiology 2, Pomology 1 and Animal Husbandry 6 are suggested as additional courses for the student fitting himself for general agriculture.

Agronomy.

Professor SIDNEY B. HASKELL, Adviser.

Course.	Credit.
Agronomy 3,	3
Agronomy 4,	3
Agronomy 5,	3
Agronomy 6,	3
Agronomy 8,	3
Animal Husbandry 9,	3
Farm Administration 4,	3
Chemistry 5,	5
Chemistry 6,	5
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Animal Husbandry.

Professor JOHN C. McNUTT, Adviser.

Course.	Credit.
Agronomy 3,	3
Veterinary Science 1, veterinary hygiene and stable sanitation,	3
Veterinary Science 2, general veterinary pathology (materia medica and therapeutics),	3
Animal Husbandry 5,	3
Animal Husbandry 6,	1
Animal Husbandry 8,	2
Animal Husbandry 9,	3
Animal Husbandry 10,	3
Animal Husbandry 11,	2
Dairying 1,	3
Farm Administration 3,	3
Farm Administration 4,	3
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Dairying.

Professor WILLIAM P. B. LOCKWOOD, Adviser.

Course.	Credit.
Animal Husbandry 5,	3
Animal Husbandry 6,	1
Animal Husbandry 8,	2
Animal Husbandry 9,	3
Animal Husbandry 11,	2
Dairying 1,	3
Dairying 2,	3
Dairying 3,	3
Microbiology 11 and 12,	3
Farm Administration 3,	3
Farm Administration 4,	3
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Poultry Husbandry.

Professor JOHN C. GRAHAM, Adviser.

Course.	Credit.
Poultry Husbandry 1,	2
Poultry Husbandry 2,	2
Poultry Husbandry 3,	1
Poultry Husbandry 4,	1-3
Poultry Husbandry 5,	1
Poultry Husbandry 6,	3
Poultry Husbandry 7,	3
Poultry Husbandry 9,	3
Pomology 1,	3
Agronomy 3,	3
Animal Husbandry 5,	3
Animal Husbandry 9,	3
Veterinary Science 7,	3
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LIST OF MAJORS IN THE DIVISION OF HORTICULTURE.**Floriculture.**

Associate Professor ARNO H. NEHRING, Adviser.

Course.	Credit.
Floriculture 1,	4
Floriculture 2,	4
Floriculture 3,	3
Floriculture 4,	3
Horticulture 3,	3
Horticulture 4,	3
Entomology 1,	3
Market Gardening 2,	3
Botany 2,	4
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Note. — Horticulture 3 and 4 is a junior subject, but to balance the work for the two years it would be better for the floricultural students to take the course in the senior year.

Forestry.

Professor WILLIAM D. CLARK, Adviser.

Course.	Credit.
Forestry 3,	3
Forestry 4,	3
Forestry 5,	5
Forestry 6,	3
Entomology 5,	3
Landscape Gardening 1,	3
Horticulture 3,	3
Horticulture 4,	3
Botany 13,	4
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Students who propose to major in forestry should elect geology and surveying in sophomore year.

Landscape Gardening.

Professor FRANK A. WAUGH, Adviser.

Course.	Credit.
Landscape Gardening 1,	3
Landscape Gardening 2,	3
Landscape Gardening 3,	3
Landscape Gardening 4,	3
Landscape Gardening 5,	2
Landscape Gardening 6 or 10,	2
Landscape Gardening 7,	3
Landscape Gardening 8,	3
Drawing 1,	3
Drawing 2,	3
Horticulture 3,	3
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Courses for juniors *only*: Landscape Gardening 1 and 2, Drawing 1 and 2.

Courses for seniors and graduates *only*: Landscape Gardening 3, 4, 7 and 8.

Courses open to juniors and seniors, both if possible: Horticulture 3 and 4.

This grouping of subjects is offered only as an example. Other groupings may be approved by the adviser, but such other groupings must be subject to the class schedule.

Pomology.

Professor FRED C. SEARS, Adviser.

Course.	Credit.
Pomology 1,	3
Pomology 2,	3
Pomology 3,	3
Pomology 4,	3
Pomology 5,	3
Pomology 6,	2
Botany 5,	2
Agronomy 5,	3
Entomology 1,	3
Entomology 2,	3
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MAJOR IN THE DIVISION OF THE HUMANITIES.**Rural Journalism.**

Associate Professor ROBERT W. NEAL, Adviser.

	Credit.
Rural Journalism 1,	3
Rural Journalism 2,	3
Rural Journalism 3,	2
Rural Journalism 4,	2
Rural Journalism 5,	1
Rural Journalism 7,	2
Rural Journalism 8,	2
Rural Journalism 9,	3
Rural Journalism 10,	3
Economics and Sociology 1,	3
Agricultural Economics 5,	3
Rural Sociology 1,	3
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LIST OF MAJORS IN THE DIVISION OF RURAL SOCIAL SCIENCE.**Agricultural Education.**

Professor WILLIAM R. HART, Adviser.

Course.	Credit.
Agricultural Education 1,	3
Agricultural Education 2,	3
Agricultural Education 3,	3
Agricultural Education 4,	3
Agronomy 3,	3
Dairying 5,	2
Farm Administration 3,	3
Poultry Husbandry 1,	2
Market Gardening 2, }	3
Agronomy 5, }	
Botany 5,	2
Pomology 1,	3
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Some substitutions of other technical courses for some of the technical courses above mentioned will be made to meet the needs of individual students.

Rural Social Science.

Professor JOHN PHELAN, Adviser.

Course.	Credit.
Economics and Sociology 1,	3
Economics and Sociology 8,	3
History and Government 3,	3
Agricultural Economics 3,	3
Agricultural Economics 5,	3
Agricultural Economics 7 or 8,	3
Rural Sociology 2,	3
Rural Sociology 5,	3
Rural Sociology 10,	3
Rural Sociology 8,	3
Agricultural Education 1 or 5,	3
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	33

The major will consist of 30 hours selected from this list.

LIST OF MAJORS IN THE DIVISION OF SCIENCE.

Agricultural Chemistry.

Associate Professor CHARLES A. PETERS, Adviser.

Course.	Credit.
Chemistry 5,	5
Chemistry 6,	5
Chemistry 9,	5
Chemistry 10,	5
Chemistry 11,	5
Chemistry 12, 14 or 16,	5
Chemistry 13,	3
Chemistry 15,	3
Chemistry 18,	2
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	38

The major will consist of 30 credit hours selected from this list. The student will be advised concerning other subjects suitable to be taken in connection with chemistry.

Economic Entomology.

Professor HENRY T. FERNALD, Adviser.

Course.	Credit.
Entomology 1,	3
Entomology 2,	2
Entomology 3,	4
Entomology 4,	4
Entomology 5,	3
Entomology 8,	3
Entomology 11,	2
Botany 5,	3
Zoölogy 3,	3
Zoölogy 4,	3
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	32

A major in economic entomology does not necessarily include all the subjects given in this list, but may be varied to some extent, in accordance with the future plans of the student, other modifications being permissible.

Microbiology.

Professor CHAS. E. MARSHALL, Adviser.

Course.	Credit.
Microbiology 1 or 2,	5
Microbiology 3 or 4,	5
Microbiology 5 or 6,	3
Microbiology 7 or 8,	3
Chemistry 3,	5
Chemistry 4,	5
Chemistry 5,	3
Chemistry 6,	3
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	32

Courses 9 in chemistry; 3, 4, 5 in botany; 3, 4, 5, 6 in zoölogy; 1, 3, 5, 6 in veterinary science, together with German and French, are suggested as collateral lines. Dairying 1 and Agronomy 5 are essential to a grasp of the larger problems involved in microbiology as applied to agriculture.

Plant Physiology and Pathology.Professor GEORGE E. STONE,¹ Adviser.

Course.	Credit.
Botany 3,	4
Botany 4,	3
Botany 9,	4 or 5
Botany 10,	4 or 5
Botany 11,	4
Botany 12,	4
Chemistry 5,	5
Chemistry 6,	5
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	33 or 35

SUMMARY.

There are four preliminary steps which a student should take in arranging for his major work.

1. Select a major.
2. Confer with major adviser for arrangement of courses, the plan to be approved by adviser in accordance with Rule 5 previously stated.
3. Select courses covering the four semesters of the junior and senior years in such a way that a minimum of 12 credits will be taken in the two divisions, the Humanities and Rural Social Science; the distribution of all but 3 of these credits may be decided by the student.
4. Choose other courses so that the total number of credits for any semester shall be not less than 16 nor more than 21. (See Rules 2 and 3.)

¹ On leave of absence; Associate Professor Osmun acting as head of Department of Botany.

C. UNDERGRADUATE COURSES.

All courses given in the *first semester bear odd numbers*; all given in the *second semester bear even numbers*. Studies are pursued in courses, "course" implying the study given a subject within one semester, without regard to the total number of hours or to the number of credits. The special mention of certain courses as prerequisite to other courses does not imply that no courses but those so mentioned are "preliminary or preparatory" within the meaning of the Book of Rules.

DIVISION OF AGRICULTURE.

Professor FOORD.

AGRONOMY.

Professor HASKELL, Assistant Professor JONES, Mr. MERKLE, Mr. COBB.

1. SOILS AND FERTILIZERS. — A study of soils and their properties, soil management, methods of soil improvement and maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments. Prerequisites, Chemistry 1 and 2. Sophomores; 2 lecture periods and 1 laboratory period weekly. Credit, 3. Professor HASKELL and Assistants.

3. FIELD AND FORAGE CROPS. — History, classification and production of maize and of those grasses, legumes, forage and root crops suited to New England conditions. The work includes lecture, laboratory and field study of these various crops. Prerequisites, Agronomy 1 and Botany 2. Primarily for juniors; 1 lecture and 2 laboratory periods. Credit, 3.

Assistant Professor JONES and Mr. COBB.

4. ADVANCED FIELD CROPS. — A study of the cereal grains, with lectures, laboratory and field study of the purity, quality and vitality of the seeds of farm crops and the handling, grading and judging of their products. Prerequisite, Agronomy 3. Primarily for juniors; 2 lectures and 1 laboratory period. Credit, 3. Assistant Professor JONES and Mr. COBB.

5. ADVANCED SOILS. — A field, lecture and laboratory course on soils and their adaptability to different uses. The field work consists of a detailed soil survey of the college farm and other areas, followed by a laboratory study of the physical properties of soils collected. Prerequisite, Agronomy 1. Primarily for seniors; 1 lecture period and 1 4-hour laboratory period weekly. Credit, 3.

Professor HASKELL and Mr. MERKLE.

6. DRAINAGE AND IRRIGATION. — A field and lecture course on soil improvement by drainage and irrigation, with special reference to problems of this nature as faced by Massachusetts farmers. Prerequisites, Agronomy 1 and Mathematics 6. One lecture period and 1 4-hour laboratory period weekly. Credit, 3. Professor HASKELL and Mr. MERKLE.

8. MANURES AND FERTILIZERS. — An advanced course, giving a general discussion of the different theories which have been held relative to the func-

tions and importance of manures and fertilizers, and leading up to the views at present accepted. Considerable attention is devoted to consideration of the experimental work which has been done, and which is now in progress, on manures and fertilizers. For seniors only. Prerequisite, Agronomy 1. Three lectures weekly. Credit, 3. Professor HASKELL.

10. BREEDING OF FIELD CROPS. — This course deals with the improvement, by selection and breeding, of the crops studied in Courses 3 and 4. Prerequisite, Agronomy 4. Seniors only; 2 lecture periods weekly. Credit, 2.

Assistant Professor JONES.

ANIMAL HUSBANDRY.

Professor McNUTT,¹ Assistant Professor QUAIFFE, Mr. WIGHT, Mr. FISH.

Required Course.

2. MARKET CLASSES AND GRADES OF LIVE STOCK. — A study of the different market classes and grades of horses, cattle, sheep and swine. The purpose of this course is to familiarize beginners with the different classes of stock, and to give them a grounding in live stock judging. Text-book, Craig's "Live Stock Judging." Freshmen; 2 laboratory periods. Credit, 2.

Professor McNUTT and Assistant Professor QUAIFFE.

Elective Courses.

3. BREEDS AND TYPES OF LIVE STOCK. — A course covering the origin, history, development and characteristics of the different breeds of horses, cattle, sheep and swine. Text-book, Plumb's "Breeds and Types of Farm Animals." Prerequisite, Animal Husbandry 2. Sophomores; 2 lectures and 2 laboratory periods. Credit, 4.

Assistant Professor QUAIFFE.

5. PRINCIPLES OF BREEDING. — This course is designed to familiarize the student with the problems involved in animal and plant improvement; to acquaint him with the facts which are already established; to scrutinize prevailing theories; and to indicate the lines and methods of further work. Some of the subjects studied are: variations, their causes and heritability; De Vrie's theory of mutations; the inheritance of acquired characters; the pure line; Mendelian law; the making of new types; the determination of sex; applications to human heredity. A few periods at the end of the course are devoted especially to the application of principles in live stock improvement. Text, "Genetics," by Herbert E. Walter. Supplementary reading. Prerequisite, Zoölogy 1. Three lectures. Credit, 3.

Mr. WIGHT.

6. LIVE STOCK MANAGEMENT. — The work of this course consists of laboratory work by the individual students in the handling of live stock; with horses, such work as halter breaking, breaking to drive, driving, harnessing, casting and fitting for show will be done; similarly, the practical handling of cattle, sheep and swine will be fully treated. Special study is given to halter making, splicing, hitches, knots and all rope work. Prerequisite, Animal Husbandry 3. Juniors; 1 laboratory period. Credit, 1.

Assistant Professor QUAIFFE.

¹ Appointment in effect Jan. 1, 1916. Vice-Associate Professor J. A. McLean resigned Sept. 1, 1915.

8. **ADVANCED STOCK JUDGING.** — This course is designed to equip animal husbandry students in the judging of classes of different types of live stock; to strengthen them in the selection of superior sires; and equip them for stock judging at fairs. Visits will be made to the best herds for the various breeds of stock in the State. Judging teams to represent the college will be selected largely from this class. Must be preceded by or accompany Animal Husbandry 6. Juniors; 2 laboratory periods. Credit, 2.

Professor McNUTT.

9. **FEEDING AND MANAGEMENT.** — A study of the principles of animal nutrition; of the composition and qualities of feeding materials; of the feeding, care and management of dairy cattle from birth to maturity, with especial attention to economic production. Text-book, Henry's "Feeds and Feeding." Prerequisite, Chemistry 5 or 7. Seniors; 3 lectures. Credit, 3.

Assistant Professor QUAIFFE.

10. **FEEDING AND MANAGEMENT.** — A continuation of Course 9, dealing in a similar manner with horses, sheep, beef cattle and swine. Prerequisite, Course 9. Seniors; 3 lectures. Credit, 3. Assistant Professor QUAIFFE.

11. **HERD AND STUD-BOOK STUDY.** — An advanced course in the study of the breeds of live stock, familiarizing the student with the detailed history of the breed, the most productive sires and dams of the various breeds, and the successful lines and methods of breeding. Prerequisites, Animal Husbandry 5 and 8. Seniors; 2 hours. Credit, 3.

Professor McNUTT [?]

12. **SEMINAR.** — Advanced study upon questions pertaining to live stock and live stock production. Each student electing this work will choose some particular line of work in which he is specially interested, and will pursue study in this subject by reading, compilation and research. There will be no regular lecture period, but seminars will be held. A satisfactory report of the results must be presented in a thesis. Open only to seniors majoring in animal husbandry. Credit, 1.

Professor McNUTT.

DAIRYING.

Professor LOCKWOOD, Assistant Professor JAMISON, Mr. COONS, Mr. BALDINGER.

Elective Courses.

1. **MILK AND MILK COMPOSITION.** — The development of the dairy business in the United States; the composition, secretion and general characteristics of milk; contamination and fermentation; the study of analysis of milk products by use of the Babcock test for fat, test for acidity and adulteration, and ordinary preservatives; moisture tests for butter; methods for testing herds and developing them to higher efficiency; problems. Two lecture hours and 1 2-hour laboratory period. Credit, 3.

Assistant Professor JAMISON and CHEMISTRY DEPARTMENT.

2. **BUTTERMILKING.** — A study of separators and cream separation; handling milk and cream for buttermaking; preparation of starters, and ripening

cream; churning; markets and their requirements; marketing, scoring and judging butter; management; problems; dairy machinery and care thereof. Prerequisite, Course 1. One lecture hour and 2 2-hour laboratory periods. Credit, 3. Professor LOCKWOOD, Assistant Professor JAMISON, Mr. COONS.

3. MILK PRODUCTS. — The manufacture of milk products other than butter, including cheddar cheese, soft and fancy cheese, ice cream, condensed milk, casein, milk powder, etc. Laboratories, largely the making of soft and fancy cheese and ice cream. Prerequisite, Dairying 1. Two lecture hours and 1 2-hour laboratory period. Credit, 3. Mr. BALDINGER.

4. MARKET MILK. — A study of market milk conditions; extent and development of the business; supply and delivery; food value of milk and its uses as food; milk and its relation to the public health; proper methods for handling milk and cream for direct consumption; certified milk, requirements and production; pasteurizing; sterilizing; standardizing and modifying; milk laws and inspection. Prerequisite, Dairying 1. Two lecture hours and 1 2-hour laboratory period. Credit, 3.

Professor LOCKWOOD, Assistant Professor JAMISON.

6. DAIRYING. — A course designed primarily for teachers of secondary agriculture. The work given will cover briefly the composition and secretion of milk, the Babcock fat test, the relation of bacteria to dairy work and principles of creaming; separators; elementary buttermaking; proper methods of handling milk and cream; and the relation of market milk to the public health. One lecture hour and 2 2-hour laboratory periods. Credit, 3.

Assistant Professor JAMISON and Mr. BALDINGER.

FARM ADMINISTRATION.

Professor FOORD, Mr. PEACOCK.

Elective Courses.

3. FARM BUILDINGS AND MACHINERY. — A study of the material equipment of the farm aside from the land; farm buildings, their location, plan and arrangement; water supply; fencing problems; farm power; farm machinery; wagons. Prerequisites, Agronomy 1, Animal Husbandry 2, Physics 1. Primarily for seniors; 2 laboratory periods and 1 lecture hour. Credit, 3.

Professor FOORD.

4. FARM MANAGEMENT. — The organization of the farm as a business enterprise. A discussion and study of some of the problems that confront the modern farmer, such as the choice of a farm, systems and types of farming, labor, marketing, records and farm accounts. Prerequisites, Agronomy 1 and 3, Animal Husbandry 2 or 3. Primarily for seniors; 2 lecture or recitation hours and 1 laboratory period. Credit, 3. Professor FOORD.

POULTRY HUSBANDRY.

Professor GRAHAM, Dr. GOODALE, Mr. PAYNE.

Elective Courses.

1. **ELEMENTS OF POULTRY CULTURE.** — This course consists of a comprehensive study of poultry-house construction, poultry-house equipment, feeds and feeding, winter-egg production, types and breeds of poultry. Juniors; 2 lectures. Credit, 2. Professor GRAHAM.

2. **ELEMENTS OF POULTRY CULTURE.** — This is a continuation of Course 1, treating the subjects of incubation, brooding, care of growing stock, breeding, market poultry, including capons, roasters and broilers, and diseases of poultry. Juniors; 2 lectures. Credit, 2. Professor GRAHAM.

3. **POULTRY PRACTICE WORK.** — This is a practical laboratory course in poultry carpentry, caponizing, killing and picking; dressing and packing poultry, sorting and preparing eggs for market. Must be preceded or accompanied by Course 1. Juniors; 1 laboratory period. Credit, 1.

Mr. PAYNE.

4. **INCUBATION AND BROODING.** — In this course students are required to set up and operate incubators and brooders, make a systematic study of the development of the chick in the egg, and the care of sitting hens. This course must be preceded or accompanied by Course 2. Juniors; time to be arranged. Credit, 1 to 3.

Mr. PAYNE.

6. **POULTRY MANAGEMENT.** — A detailed study of large poultry farms and equipment, such as bone cutters, feed cutters, cramming machines, etc.; the laying out and planning of poultry buildings of all kinds; mating of fowls; attention to poultry diseases and investigation work carried on by experiment stations is prominent. A few good poultry plants will be visited by the class for practical demonstrations. Prerequisites, Courses 1, 2, 3, 4, 7, 9 and 10. Seniors; 2 lectures, 1 laboratory period. Credit, 3.

Professor GRAHAM and Mr. PAYNE.

7. **ADVANCED POULTRY JUDGING.** — This course includes a study of the origin and history of breeds and varieties, poultry organizations and poultry shows. The American Standard of Perfection will be used as a text. Prerequisites, Courses 1, 2, 3, 4 and 5. Seniors; 1 lecture and 2 laboratory periods. Credit, 3.

Mr. PAYNE.

8. **INVESTIGATIONAL WORK.** — This course is designed especially for students who are planning to do experiment station work. Students will be assigned specific problems to work out experimentally, or they may be required to assist in carrying on such work. Credit, 1 to 3.

Dr. GOODALE.

9. **MARKET POULTRY AND POULTRY PRODUCTS.** — This course includes the study of market classifications of poultry, eggs and feathers; the requirements of different markets, methods of marketing, advantages and disadvantages

of cold storage of poultry and eggs. Students will be required to fatten several lots of chickens by different methods and rations. Accurate data must be kept showing the gain in weight and quality, also the cost of feed, labor, etc., and the profit and loss. Judging and scoring of market poultry, both alive and dressed, and market eggs will be an important feature of this course. Prerequisites, Courses 1, 2 and 3. Seniors; 1 lecture or conference period and laboratory periods to be arranged. Credit, 3. Mr. PAYNE.

10. PEN MANAGEMENT. — This is a practical laboratory course. Students are required to care for a pen of fowls, keeping accurate records of eggs produced, food consumed, weather conditions, health of fowls, and profit and loss. Prerequisite, Course 1. Juniors; time to be arranged. Credit, 1. Mr. PAYNE.

RURAL ENGINEERING.

Professor GUNNESS.

Elective Courses.

3. FARM STRUCTURES. — Study of the strength, durability and cost of building materials; water supply; lighting and heating systems for the farm; drawing plans, writing specifications and estimating the cost of buildings; concrete construction as applied to foundations, silos, tanks, posts, floors and walks. One lecture and 2 laboratory periods. Credit, 3.

Professor GUNNESS.

4. FARM MACHINERY. — Study of the care and operation of tillage, seeding, harvesting, pumping and spraying machinery; steam and gas engines. Special attention will be given to the use of power on the small farm. Practice in the adjustment of the various machines, babbitting and fitting bearings, lining shafts and pulleys, lacing belts, splicing rope and packing valves. One lecture and 2 laboratory periods. Credit, 3.

Professor GUNNESS.

5. POWER MACHINERY. — Steam and gasoline engines, refrigerating machinery, electric motors and dynamos. Practice in pipe fitting, soldering, babbitting and fitting bearings, lacing belts and packing valves. Course 5 is intended primarily for dairy students, but would be valuable to any man who would expect to use engines, pumps or electrical machinery. One lecture and 2 laboratory periods. Credit, 3.

Professor GUNNESS.

6. FARM MECHANICS. — A general study of the farm equipment; farm buildings, their location, plan and arrangement; water supply; sewage disposal; lighting and heating systems; farm power and farm machinery. Course 6 has been planned for the benefit of those students who want a general course in farm mechanics but cannot spend the time to take the two courses, 3 and 4. One lecture and 2 laboratory periods. Credit, 3.

Professor GUNNESS.

DIVISION OF HORTICULTURE.

Professor WAUGH.

[The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening and market gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.]

2. NURSERY PRACTICE. — This course treats of the fundamental methods of plant propagations by seeds, cuttings, budding, grafting, etc. Lectures and practicums. Sophomores; 1 lecture period and 1 laboratory period. Credit, 2.
Assistant Professor THOMPSON.

Elective Courses (General).

3. PLANT MATERIALS. — This course aims to make the student familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work and with the methods of propagating them. Prerequisite, Horticulture 2. Two lecture periods and 1 laboratory period. Credit, 3.
Assistant Professor THOMPSON.

4. PLANT MATERIALS. — A continuation of Course 3, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions. Prerequisite, Horticulture 3. Two lecture periods and 1 laboratory period. Credit, 3.
Assistant Professor THOMPSON.

6. PLANT BREEDING. — This course is designed to introduce advanced students to the best modern views of variation, heredity and evolution, and to the best methods of studying the phenomena found in these subjects. The principles educed apply to both animal breeding and plant breeding, but the laboratory work (of which there is considerable) is concerned chiefly with plant life. Some practice work in hybridization and selection is undertaken, and students are trained as far as possible in the practical application of those principles which have direct bearing on the breeding of plants and the cultivation of crops. Open only to students well prepared in agricultural or horticultural subjects. Seniors and graduates; 2 lecture periods and 1 2-hour laboratory period. [Not given in 1915-16.] Credit, 3.

FLORICULTURE.

Associate Professor NEHRING, Mr. THURSTON.

Elective Courses.

1. GREENHOUSE MANAGEMENT. — This course is designed to familiarize students with the methods followed in the management of greenhouse crops. The students are instructed in the practical operations of watering, potting, fumigating, ventilating and in the methods of propagation of plants by seed

and cuttings. They will also be expected to arrange their hours according to the needs of the work. Prerequisite, Horticulture 2. Juniors; 2 lectures, 6 laboratory hours. Credit, 5.

Associate Professor NEHRLING and Mr. THURSTON.

2. GREENHOUSE MANAGEMENT. — Continuation of Course 1. In addition, work in the use of cut flowers and plants in decorative work, the arrangement of flowers in baskets, designs, vases, table and home decorations will be considered. Juniors; 2 lectures, 6 laboratory hours. Credit, 5.

Associate Professor NEHRLING and Mr. THURSTON.

3. COMMERCIAL FLORICULTURE. — A detailed study will be made of the methods cultural for greenhouse plants and cut flowers for wholesale and retail markets. The care and marketing of all florists' crops will also be considered. Assigned readings on these topics. Prerequisites, Floriculture 1 and 2. Seniors; 2 lectures, 4 laboratory hours. Credit, 4.

Associate Professor NEHRLING.

4. COMMERCIAL FLORICULTURE. — As stated under Course 3. Prerequisites, Floriculture 1, 2 and 3.

5. GREENHOUSE CONSTRUCTION. — The location, arrangement, construction, cost, heating and ventilating of greenhouse structures; also the drawing of plans and drafting of specifications for commercial houses and private ranges. Such practical work as glazing, the construction of concrete benches and cold frames will be included in this course. Should be taken with Floriculture 1. Juniors; 2 lectures, 2 laboratory hours. Credit, 3.

Associate Professor NEHRLING and Mr. THURSTON.

6. GARDEN FLOWERS AND BEDDING PLANTS. — This course aims to make the student familiar with those annuals, herbaceous perennials, bulbs and bedding plants used in landscape work. Their propagation, culture and uses will be considered. Assigned readings and field trips. Two lectures, 3 laboratory hours. Credit, 3.

Associate Professor NEHRLING and Mr. THURSTON.

7. CONSERVATORY WORK AND DECORATIVE PLANTS. — A study of the tropical and subtropical foliage and flowering plants used in conservatory work. Their arrangement and care will also be considered. Assigned readings. Should be taken with Course 4. Prerequisites, Floriculture 1, 2 and 3. Two lectures, 2 laboratory hours. Credit, 3. Associate Professor NEHRLING.

FORESTRY.

Professor CLARK.

Elective Courses.

1. PRINCIPLES OF FORESTRY. — A lecture course for the purpose of giving the students a general view of the whole field of forestry and what forestry attempts to accomplish and has accomplished. Juniors and seniors; not required of students who propose to major in forestry. Two lectures. Credit, 2.

Professor CLARK.

2. **WOOD TECHNOLOGY.** — A study of the commercial woods found in the lumber markets, methods of identification, uses, strength values, technical qualities, decay and methods of preservation. Juniors; 1 lecture and 2 laboratory periods. Credit, 3. Professor CLARK.

3. **DENDROLOGY.** — During the first part of the semester frequent field trips will be made to identify and study the habits of our native forest trees. Later, the classification, range, distribution, forest habits, quality, uses and identification of wood of the commercial timber trees of the United States will be studied. Juniors; 2 2-hour periods; lectures, recitations, laboratory or field work at option of instructor. Credit, 3. Professor CLARK.

4. **SILVICULTURE.** — Factors influencing forest growth; forest types; silvicultural systems; care and protection of forests; forest description; forest nursery practice and forest planting. Prerequisite, Forestry 3. Juniors; 3 lectures weekly until May 1; during May and June, 1 lecture and 1 4-hour field period weekly. Credit, 3. Professor CLARK.

5. **FOREST MENSURATION.** — Methods of determining the volume of trees, logs and entire forests. Methods of computing volume tables, tree and forest growth and yield tables. Timber estimating. Seniors; 3 lectures, 72 hours of field work. Credit, 5. Professor CLARK.

6. **SEMINAR — REPORT.** — This may involve research, laboratory or field work in the investigation of some subject, together with a review of the literature relating to it and an original written report evidencing the results. Subject to be chosen in conference with Professor Clark. Seniors. Credit, 3. Professor CLARK.

LANDSCAPE GARDENING.

Professor WAUGH, Assistant Professor HARRISON.

Elective Courses.

1. **ELEMENTS OF LANDSCAPE GARDENING.** — Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected designs of leading landscape gardeners; grade design, road design and field work. Students should have preparation in surveying, mathematics, plant materials and drawing. Must be followed by Course 2. Juniors; 6 hours a week. Credit, 3.

Assistant Professor HARRISON.

2. **ELEMENTS OF LANDSCAPE GARDENING.** — As stated under Course 1. Prerequisite, Course 1.

3. **GENERAL DESIGN.** — Field notes; examination of completed works and those under construction; design of architectural details, planting plans, gardens, parks and private grounds; written reports on individual problems. Seniors; prerequisites, Landscape Gardening 1 and 2, and either plant materials (Horticulture 3 and 4) or advanced mathematics; must be followed by Course 4; 6 hours. Credit, 3. Assistant Professor HARRISON.

4. GENERAL DESIGN. — As stated under Course 3. Prerequisite, Course 3.

5. THEORY OF LANDSCAPE ART. — The general theory and applications of landscape study, including a brief history of the art. Seniors and graduates; 2 hours. Credit, 2. Professor WAUGH.

6. ARCHITECTURE. — The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, conferences, practice in designing; 2 hours. (Alternating with Course 10 and not to be given in 1915-16.) Credit, 2.

Assistant Professor HARRISON.

7. CIVIC ART. — The principles and applications of modern civic art, including city planning, city improvement, village improvement and rural improvement with special emphasis upon country planning. Prerequisites, Courses 1, 2 and 3; must be followed by Course 8. Six hours. Credit, 3.

Professor WAUGH.

8. CIVIC ART. — As stated under Course 7. Prerequisite, Course 7.

10. CONSTRUCTION AND MAINTENANCE. — Detailed instruction in methods of construction and planting in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc. (Alternating with Course 6.) Two hours. Credit, 2.

Assistant Professor HARRISON.

MARKET GARDENING.

Professor TOMPSON, Assistant Professor THOMSON.

Elective Courses.

2. ELEMENTS OF MARKET GARDENING. — A course designed for an introduction to market gardening as a business. The work consists primarily of actual field experience in handling vegetable crops from seed to maturity. This is supplemented with lectures and text-book, in which a study of methods, soils, fertilization, tillage and management is made. Juniors; 5 hours. Credit, 3.

Assistant Professor THOMSON.

3. ADVANCED MARKET GARDENING. — A continuation of the work begun in Market Gardening 2, taking up problems of seed growing, selection of varieties, crop management, harvesting, storage and marketing. A study is made of the greenhouse vegetable industry, and considerable time devoted to growing the special forced crops. Some time is given to a systematic study of vegetable description, classification and nomenclature. Collateral reading is required. Seniors; prerequisite, Market Gardening 2; 5 hours. Credit, 3.

Assistant Professor THOMSON.

POMOLOGY.

Professor SEARS, Associate Professor CHENOWETH.

Elective Courses.

1. **PRACTICAL POMOLOGY 1.** — A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, culture of orchards, orchard fertilizers, cropping orchards, etc. Text and reference books; field and laboratory exercises. Prerequisite, Horticulture 2. Juniors; 4 hours. Credit, 3. Professor SEARS.

2. **PRACTICAL POMOLOGY 2.** — As stated under Course 1. Prerequisites, Horticulture 2 and Pomology 1. Juniors; 4 hours. Credit, 3. Professor SEARS.

3. **SYSTEMATIC POMOLOGY.** — A study of the varieties of the different fruits and of nomenclature, with critical descriptions; special reference being given to relationships and classification. Text-books, laboratory and field exercises. Prerequisites, Horticulture 2 and Pomology 1 and 2. Seniors; 4 hours. Credit, 3. Associate Professor CHENOWETH.

4. **SYSTEMATIC POMOLOGY.** — As stated under Course 3. Prerequisites, Horticulture 2 and Pomology 1, 2 and 3. Seniors; 4 hours. Credit, 3.

5. **COMMERCIAL POMOLOGY.** — The picking, handling, storing and marketing of fruits, including a discussion of storage houses, fruit packages, methods of grading and packing, manufacturing, etc. Especial emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of all the principal fruits, together with the manufacture of by-products. Open only to men majoring in pomology. Prerequisites, Horticulture 2 and Pomology 1 and 2. Seniors; 1 lecture and 2 laboratory periods. Credit, 3. Associate Professor CHENOWETH.

6. **SPRAYING.** — A study of (a) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material, formulas used, cost, tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small fruit plantations. Prerequisites, Horticulture 2 and Pomology 1 and 2. Seniors; 3 hours. One lecture period and 1 laboratory period. Credit, 2. Professor SEARS.

DRAWING.

Mr. Root.

Elective Courses.

1. **FREE-HAND DRAWING.** — Lettering; free-hand perspective; sketching from type models, leaves, flowers and trees, houses, etc.; laying flat and graded washes in water colors; water color rendering of leaves, flowers and trees; conventional coloring and map rendering in water colors; conventional signs and mapping in ink. Juniors; 6 hours. Credit, 3.

Mr. Root.

2. **MECHANICAL DRAWING.** — Inking exercises; geometric problems; projection; intersections, isometric; shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry. Juniors; 6 hours. Credit, 3.

Mr. Root.

DIVISION OF SCIENCE.

Professor HENRY T. FERNALD.

BOTANY.Professor STONE,¹ Associate Professor OSMUN, Assistant Professor ANDERSON, Mr. McLAUGHLIN, Mr. SMITH, Mr. DORAN.

[The object of the courses in botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. Undergraduate work extending through five semesters is offered. Students sufficiently prepared are occasionally permitted to undertake special physiological and pathological investigations. A botanical conference is held weekly, wherein new problems in botanical science are considered by graduate students and the seniors who elect botany. A complete revision of the courses offered by the department will appear in the spring supplement of this catalogue.]

Required Course.

2. GENERAL BOTANY. — The morphology, physiology and classification of plants. This course is fundamental. Its aim is to lay a foundation for the more specialized courses in botany which follow, and to provide a general knowledge of the science for those students who will not take further work in the department. This course is prerequisite to all other courses given by the department. In the laboratory much time is devoted to study of the structure of higher or seed plants. In this work first attention is given to the cell as the unit of structure; from the cell is traced the gradual development of the tissues of the entire plant. During the spring period of the semester much practice is given in determining and naming plants, Gray's "New Manual of Botany" being employed. In connection with this work each student is required to collect and prepare an herbarium of 75 species of plants. The lectures aim to amplify and interpret the laboratory work, dealing also with the function (physiology), classification (taxonomy) and ecology of plants. Though only 1 lecture period is scheduled for this course, it is understood that laboratory hours may be used for lectures at the discretion of the instructor. Sophomores; 1 lecture and 3 laboratory periods. Credit, 4.

Associate Professor OSMUN, Mr. McLAUGHLIN, Mr. SMITH and Mr. DORAN.

Elective Courses.

3. CRYPTOGAMIC BOTANY. — Systematic study of typical forms of the lower plants (bacteria, algæ, fungi, lichens, mosses and ferns); instruction in laboratory technique and methods; field excursions for the purpose of observing environmental habits and collecting material for laboratory study; collateral reading. This course is intended for those students who wish to specialize in any of the biological sciences, and is a prerequisite of Courses 9, 10, 15 and 16. Students electing this course may attend the lectures in Course 5. Prerequisite, Course 2. Primarily for juniors; 1 lecture hour and 3 2-hour laboratory periods. Credit, 4.

Mr. McLAUGHLIN.

4. CRYPTOGAMIC BOTANY. — As stated in Course 3. Prerequisite, Course 3. One lecture hour and 2 2-hour laboratory periods. Credit, 3.

¹ Absent on leave; Associate Professor Osmun acting as head of department.

5. DISEASES OF CROPS. — This course comprises a study of the common diseases of crops, their nature, causes and methods of prevention and control. In the laboratory macroscopic examinations of diseases are made, and the principal experiment-station and government literature on plant diseases is read. Intended especially for students majoring in agronomy, floriculture, landscape gardening and pomology. Prerequisite, Course 2. Primarily for juniors; 1 1-hour lecture and 1 2-hour laboratory period. Credit, 2.

Assistant Professor ANDERSON, Mr. McLAUGHLIN and Mr. SMITH.

7. DISEASES OF CROPS. — This course is more specialized than Course 5, and is intended to meet the needs of the student who wishes to make a more thorough study of the diseases of the particular group or groups of crops in which his interest lies; *e.g.*, diseases of fruits, diseases of field crops, diseases of trees and shrubs. Laboratory work consists of microscopic and macroscopic examination of diseases, and extensive reading of literature concerning them. Prerequisite, Course 2. Students taking this course who have not previously taken Course 5 will attend the lectures in Course 5, and if they continue in botany the second semester, must take Course 8. Seniors; 1 lecture and 3 2-hour laboratory periods. Credit, 4. Assistant Professor ANDERSON.

8. DISEASES OF CROPS. — As stated in Course 7. Prerequisite, Course 7.

9. PLANT PATHOLOGY. — This course embraces a comprehensive study of diseases of plants, including detailed training in laboratory methods and technique. Much time is devoted to the study of literature and representative life histories of pathogens, the making of pure cultures, and artificial inoculation of hosts. Students taking this course are fitted for civil service, experiment-station and college positions in plant pathology. Course 10 must follow. Prerequisites, Botany 2, 3 and 4. Seniors; 1 lecture and 4 2-hour laboratory periods. Credit, 5. Associate Professor OSMUN.

10. PLANT PATHOLOGY. — As stated in Course 9. Prerequisite, Course 9.

11. PLANT PHYSIOLOGY. — This is a general course dealing with such topics as absorption, nutrition, growth, movement and the tropisms of plants, and requires previous training in organic chemistry and botany. Prerequisite, Botany 2. Seniors; 1 lecture and 3 2-hour laboratory periods. Credit, 4.

Assistant Professor ANDERSON and Mr. DORAN.

12. PLANT PHYSIOLOGY. — As stated in Course 11. Prerequisite, Course 11.

13. SHADE-TREE MANAGEMENT. — Physiology and pathology of shade-trees. This course includes a comprehensive study of the diseases, structure and functions of trees and shrubs, and of every agency which in any way affects shade-trees. Laboratory work and lectures; extensive reference reading. Designed for those students who intend to take charge of parks or large estates, or to become tree wardens, city foresters, landscape gardeners or professional advisers and caretakers. Prerequisite, Courses 2 and 5. Must be followed by Course 14. Seniors; 1 lecture period and 3 2-hour laboratory periods. Credit, 4. Mr. SMITH.

14. SHADE-TREE MANAGEMENT. — Physiology and pathology of shade-trees, as stated in Course 13. Prerequisite, Course 13.

15. HISTOLOGICAL TECHNIQUE. — This course comprises training in general histological methods, including the use of precision microtomes and various methods of killing, fixing, sectioning, staining and mounting of plant materials. This is a technical course in histology, of value to students intending to become research or teaching botanists. It is recommended for students taking Courses 9 and 10, as an aid to the study of relationship between host and parasite, and is open to those taking Courses 13 and 14, who desire to make their studies in tree structure more comprehensive. Collateral reading and conferences. Prerequisites, Botany 2, 3 and 4. Seniors; 3 or 5 1/2-hour laboratory and conference periods. Credit, 3 or 5.

Associate Professor OSMUN.

16. HISTOLOGICAL TECHNIQUE. — As stated in Course 15. Prerequisite, Course 15.

GENERAL AND AGRICULTURAL CHEMISTRY.

Professor LINDSEY, Professor WELLINGTON, Professor CHAMBERLAIN, Associate Professor PETERS, Associate Professor ANDERSON, Mr. SEREX, Mr. ERICHSEN, Mr. MACNEIL, Mr. PERRY, Mr. PHILLIPS.

[The course in chemistry aims to teach accurate observation, logical thinking and systematic and constant industry. It likewise aims to give those students following the several agricultural occupations, or who are preparing themselves for work as teachers and investigators in the other sciences, a knowledge of the subject sufficient to enable them to apply it in their various lines of work. Students taking all of the undergraduate courses and intending following chemistry as a vocation are prepared for positions as instructors in high schools and colleges in the agricultural experiment stations, the United States Department of Agriculture, as well as in fertilizer, cattle food, sugar and dairy industries. Students are encouraged to take graduate work leading especially to the degree of M.Sc., and to thus prepare themselves for advanced positions as teachers in the agricultural colleges, as research chemists, and likewise for the more responsible positions connected with the different agricultural industries of the country. A fuller knowledge of the course of instruction will be found by consulting the following outline.]

Required Courses.

1A. GENERAL CHEMISTRY. — An introduction to the fundamental chemical laws, together with a study of the common acid-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemistry." This course is for those students who do not present chemistry for entrance, and who begin the subject in college. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor PETERS, Mr. SEREX, Mr. ERICHSEN
and Mr. PERRY.

1B. ADVANCED GENERAL CHEMISTRY. — A review of the fundamental chemical laws, together with the common acid and base-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemistry." The laboratory work takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur and

emulsions. In addition to these, preparations outlined in Blanchard's "Synthetic Inorganic Chemistry" are made. This course is for students who present chemistry for entrance. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON, Mr. SEREX, Mr. ERICHSEN
and Mr. PHILLIPS.

2A. GENERAL CHEMISTRY. — A continuation of Course 1A. A study of metals and their compounds. The laboratory work is the same as described under 1B.

Associate Professor PETERS and Assistants.

2B. INORGANIC AGRICULTURAL CHEMISTRY. — A study of the chemical composition, properties and reactions of soils, fertilizers, fungicides and insecticides, and the common materials of construction, such as tile, brick, cements, paints, etc. Text-book, Fraps' "Principles of Agricultural Chemistry." The laboratory work is divided into three parts, as follows: (a) qualitative examination of soil, plant ash and superphosphate; (b) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, etc.; (c) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc. Prerequisite, Course 1B. Freshmen; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON and Assistants.

Elective Courses.

3. QUALITATIVE ANALYSIS. — *Basic.* — A course in the systematic analysis of metallic salts, presented from the ionic viewpoint. The student studies closely the tests used in the separation and identification of the metals; he then applies these tests to unknown mixtures. Text, Medicus' "Qualitative Analysis," with Böttger's "Qualitative Analysis" and Treadwell-Hall's "Qualitative Analysis" for reference. Prerequisite, Course 2; should be taken, particularly, by all intending to follow chemistry as a vocation. Sophomores; lecture, 1 hour; laboratory, 4 hours. Credit, 3.

Associate Professor ANDERSON and Mr. PHILLIPS.

4. QUALITATIVE ANALYSIS. — *Acidic.* — A continuation of Course 3. A large part of the semester is spent in the examination qualitatively of minerals and of agricultural products. Prerequisite, Course 3. Sophomores; lecture, 1 hour; laboratory, 4 hours. Credit, 3.

Associate Professor ANDERSON and Mr. PHILLIPS.

5. ORGANIC CHEMISTRY. — This course, with Course 6, continues through the junior year. The two courses are designed especially: (1) for those who are looking forward to positions as chemists in agricultural colleges or experiment stations, the United States Department of Agriculture, or similar places, and who need a knowledge of chemistry for itself; and (2) for those who are expecting to enter like positions in other sciences, and who will use their knowledge of chemistry in a secondary way. It consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured

from them. These include alcohols, acids, esters, fats, carbohydrates, proteins, etc. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and thus for future work in agricultural chemical investigation. Prerequisites, Courses 1, 2, 3 and 4 (Courses 3 or 4 will not be required as prerequisites for those majoring in other courses than chemistry). Juniors; those electing Course 5 are expected to elect Course 6; lectures, 3 hours; laboratory, 4 hours. Credit, 5.

Professor CHAMBERLAIN and Mr. PERRY.

6. As stated under Course 5.

[AGRICULTURAL CHEMISTRY. — The two following courses in general agricultural chemistry are designed especially for students majoring in the different departments of the Divisions of Agriculture and Horticulture, and every effort is made to meet the demands of these departments. They are for students in practical agriculture, and not for those intending to take up scientific lines of work. They form an alternative group with either Courses 3 and 4 or 5 and 6.]

7. INORGANIC AGRICULTURAL CHEMISTRY. — The same as Course 2B. This course is designed for those men who have had only Courses 1A and 2A. Prerequisites, Courses 1A and 2A. Juniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON and Mr. PHILLIPS.

8. ORGANIC AGRICULTURAL CHEMISTRY. — The course embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, absorption and metabolism, animal nutrition, animal foods, rations, etc., and also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar, alcohol, wood pulp and paper. The treatment of the subject will be general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products. Prerequisites, Courses 1 and 2. Juniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Professor CHAMBERLAIN and Mr. PERRY.

9. QUANTITATIVE ANALYSIS. — Instruction in this course includes the gravimetric and volumetric determinations of some of the commoner metals and non-metals in minerals and industrial products. Aside from teaching accurate observation and care in manipulation, it is intended for those who would learn the exact methods for determining the elements, particularly, in inorganic substances, and is the forerunner of other courses intended to fit men to become expert analysts. Talbot's "Quantitative Chemical Analysis" is used as a text. Prerequisites, Courses 1, 2 and 3 or 4. Juniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Professor WELLINGTON, Associate Professor PETERS and Mr. MACNEIL.

10. AGRICULTURAL CHEMICAL ANALYSIS. — In this course and Course 11 the methods previously studied, and other approved methods, are applied to the examination of agricultural materials. The analysis of fertilizers, in-

secticides, fungicides and soils is followed by that of cattle foods, dairy products, sugars, starches and allied substances. Prerequisite, Course 9. Juniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Professor WELLINGTON, Associate Professor PETERS and Mr. MACNEIL.

11. AGRICULTURAL CHEMICAL ANALYSIS. — As stated under Course 10. Prerequisite, Course 10. Seniors; lecture, 1 hour; laboratory, 8 hours. Credit, 5.

Associate Professor PETERS and Mr. MACNEIL.

12, 14 and 16. *See below, following Course 15.*

13. PHYSIOLOGICAL CHEMISTRY. — This course is intended to be supplementary to Courses 5 and 6 and Courses 7 and 8. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 5 and 6, it will give acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 5 and 6 are built up in the living organism or are used as food by it. In the lectures the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory, experimental studies are made of the animal body and the processes and products of digestion, secretion and excretion. The course gives additional training in the chemical problems of agricultural experiment-station work, especially those connected with investigations in animal and plant nutrition. To those who will not take up scientific lines of work, but will follow practical agriculture, it will give an opportunity for a more detailed study of the chemistry and physiology of problems which were treated generally in Courses 7 and 8. Prerequisites, preferably, Courses 5 and 6 or 7 and 8. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Professor CHAMBERLAIN and Mr. PERRY.

15. PHYSICAL CHEMISTRY. — A résumé of general chemistry from the viewpoint of physical chemistry and the application of physical chemistry to agricultural chemistry. Prerequisite, Course 9. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor ANDERSON and Mr. PHILLIPS.

[GENERAL STATEMENT CONCERNING COURSES 12, 14 AND 16. — Each student electing either of these courses will be required to take up and follow out some special line of work, the object being to acquaint him with methods of original inquiry. A single concrete example may be found in a comparative study of the different methods for the determination of the several forms of nitrogen. A thesis may not be required, but frequent consultation of the literature bearing on the subject will be necessary. These courses are valuable for all chemists, and particularly so for those intending to take up experiment-station work. A student may choose any one but not two of these separate courses.]

12. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS. — The student is given a problem to solve either in analytical chemistry or related to the agricultural industries. This will acquaint him with the methods used in research and with the literature, and show him how to handle problems in this field of chemistry when occasion arises.

Associate Professor PETERS.

14. **SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.** — In this course, as in Courses 12 and 16, the student will be able to give his attention primarily to one line of chemical study. To those whose tastes and interests are in connection with the organic and physiological problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats, organic nitrogenous compounds in fertilizers and soils and their relation to plants, the commercial production of alcohol from agricultural products, digestion and dietary studies, the chemical study of dairy products, etc. Prerequisites, Courses 5, 6 and 13. Seniors; laboratory, 10 hours. Credit, 5.

Professor CHAMBERLAIN.

16. **SPECIAL WORK IN PHYSICAL CHEMISTRY.** — The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. Each student will select one line of work and follow it through the course, repeating some of the original work. Prerequisite, Course 15. Laboratory, 10 hours. Credit, 5.

Associate Professor ANDERSON.

18. **HISTORY OF CHEMISTRY.** — An exposition of the development of chemical knowledge from the earliest times to the present. Although the entire history will be included, the larger portion of it will receive only brief mention in order that the questions of vital interest in modern life and industry may be studied at greater length. Particular attention will be given to the questions of plant and animal industry. Chemists are strongly advised to take this course. Seniors; lectures, 2 hours. Credit, 2.

Professor WELLINGTON.

ENTOMOLOGY.

Professor FERNALD, Professor CRAMPTON, Associate Professor GATES, Dr. REGAN.

Elective Courses.

1. **GENERAL AND ECONOMIC ENTOMOLOGY.** — Course 1 comprises a general introduction to the study of insects, including studies on their structure as applied to their identification; the principles of classification; a systematic examination of the different groups and of the most important economic insects of each group, including their life histories and habits, recognition of their work as shown in the collections, and methods for their control. The most important insecticides and their preparation and application are also treated. Students electing Course 1 are expected to take Course 2. Juniors; 3 lecture periods. Credit, 3.

Professor FERNALD.

2. **GENERAL AND ECONOMIC ENTOMOLOGY.** — A continuation of Course 1, with laboratory and field work on methods of collecting, preserving and studying insects and their work. Prerequisite, Entomology 1. Juniors; 2 laboratory or field periods. Credit, 2.

Professor FERNALD.

3. **ADVANCED ENTOMOLOGY.** — This course is subdivided, the time spent on the various subdivisions differing somewhat according to the particular needs of those taking it; and it is to a large degree given in the form of in-

dividual instruction, special attention being paid to the pests attacking the particular crops in which the student is most interested. The student may specialize in fruit pests, market-garden pests, greenhouse pests, field crop pests, etc., to a large extent, in accordance with his plans for future work.

A. Morphology. — Careful studies of the structure of insects belonging to each of the larger and more important orders, together with lectures on the subject, followed by the identification of insects of each of these groups and the study of the collections, to teach the use of the analytical tables and of structural characters in the determination of insects.

B. Histology. — Lectures on the internal anatomy and histology of the various organs, with particular reference to those affected by the various insecticides.

C. Insecticides and Apparatus. — Lectures on the chemistry, preparation and application of the different insecticides, their merits and defects; tests for detecting adulterations; comparative tests of nozzles and other apparatus; and a study of other methods of insect control, together with laboratory work.

D. Coccidology. — Lectures and laboratory work on methods of preserving, mounting and identifying scale insects, particular attention being given to those of greatest economic importance.

E. Bibliography. — Studies of the various entomological publications and of the methods of finding the literature on any insect.

F. Special Studies. — In these studies the insects most closely related to the future occupation of the student will receive attention. The results of these studies are brought together in the form of an essay or thesis; this will include all the essentials of what is known of the life history, habits and injuries caused by each insect studied, together with methods of treatment, and a list of the best articles found in the course of the work. Comstock's "Manual for the Study of Insects" is used in the laboratory work. Seniors; prerequisite, Entomology 2; students electing Course 3 are expected to take Course 4; 1 1-hour lecture period and 3 2-hour laboratory or field periods. Credit, 4.

Professor FERNALD and Associate Professor CRAMPTON.

4. ADVANCED ENTOMOLOGY. — As stated in Course 3. Prerequisite, Course 3.

5. FOREST AND SHADE-TREE INSECTS. — A study of the insects injurious to forest and shade-trees, and of methods for their control, with laboratory and field work on these insects, and a study of what has been published about them. Seniors; prerequisites, Entomology 1 and 2; 1 lecture and 2 2-hour laboratory or field exercises. Credit, 3.

Professor FERNALD.

8. BEEKEEPING. — This course comprises a general consideration of the biology of the honeybee and the elements of practical beekeeping. Some topics covered are: life history, general behavior and instincts, structure, products, relations of bees to plants, the honey flora. The course aims particularly to afford first-hand, practical experience with bees, to the end of enabling their proper maintenance for any purpose, horticultural, educational or apicultural. Bee diseases, a thorough understanding of which is fundamental, are emphasized. So far as possible the work is made individual in con-

structing materials and apparatus and in the manipulation of bees. Juniors; seniors may elect; Courses 1 and 2 form a desirable preparation; 2 lectures, 1 2-hour laboratory period. Credit, 3. Associate Professor GATES.

10. **ADVANCED BEEKEEPING.** — This course deals with the advanced and special problems of the beekeeper. Besides considering those difficulties which at present confront the industry, subjects necessarily of limited treatment in the previous course are expanded for the development of particular technique and manipulation. Apiary management, including the principles of queen rearing, are practiced. The course should further qualify for apicultural instruction and inspection service, affording familiarity with the special literature and methods needed in investigation and research. The policy of individual instruction is continued in so far as practicable. Primarily for seniors, but juniors may elect; prerequisite, Course 8; 1 lecture, 1 2-hour laboratory period. Credit, 2. Associate Professor GATES.

11. **EVOLUTION.** — In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the appearance of man; his future in the light of his past development; and the evolution of human institutions and ideas. Consideration is also given to the theories concerning the factors of evolution, the general problems of heredity and similar topics. The course closes with a brief discussion of the philosophical, moral and social aspects of the problems involved, and the influence of the idea of evolution upon modern thought. The lectures are supplemented by collateral reading; and a portion of the time is used for the purpose of demonstration, or discussion by the class. Seniors; juniors may elect; 2 lecture periods. Credit, 2. Professor CRAMPTON.

MATHEMATICS AND CIVIL ENGINEERING.

Professor OSTRANDER, Assistant Professor DUNCAN, Assistant Professor MACHMER, Mr. HAZELTINE.

Required Courses.

1. **HIGHER ALGEBRA.** — A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Reitz and Crathorne's "College Algebra." Freshmen; 3 hours a week. Credit, 3.

Assistant Professor DUNCAN, Assistant Professor MACHMER and Mr. HAZELTINE.

2. **HIGHER ALGEBRA.** — As stated under Course 1, but for two hours only. Credit, 2.

3. SOLID GEOMETRY. — Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Wentworth and Smith's "Solid Geometry." Freshmen; required unless accepted for admission; 2 hours a week. Credit, 2.

Assistant Professor DUNCAN, Assistant Professor MACHMER and
Mr. HAZELTINE.

4. PLANE TRIGONOMETRY (in charge of Department of Physics). — The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry." Freshmen; 3 hours. Credit, 3.

Professor HASBROUCK and Assistant Professor ROBBINS.

Elective Courses.

5. MENSURATION AND COMPUTATION. — The course includes a review of methods of computation, with special emphasis on short and abbreviated processes, together with methods of checking computations and of forming close approximations; use of slide rule. Also the graph, mensuration of plane and solid figures, weights and measures and elementary mechanism. Numerous practical problems are selected from such subjects as the following: the mathematics of woodworking; rough lumber; general construction; forestry methods in heights of trees; pulleys, belts and speeds; power and its transmission; dairying; agronomy; computation of areas from simple measurements. Primarily for juniors; 3 hours. Credit, 3.

Assistant Professor MACHMER.

6. PLANE SURVEYING. — The elements of the subject, including the adjustment and use of the usual instruments. Text-book and lectures. Sophomores; 6 hours a week. Credit, 3.

Professor OSTRANDER, Assistant Professor DUNCAN, Assistant Professor
MACHMER and Mr. HAZELTINE.

7. ANALYTIC GEOMETRY. — A discussion of the geometry of the line, the circle, of conic sections and of the higher plane curves. Fine and Thompson's "Coördinate Geometry." Prerequisites, Mathematics 1, 2, 3 and 4. Primarily for juniors; 3 hours a week. Credit, 3.

Professor OSTRANDER.

8. DIFFERENTIAL AND INTEGRAL CALCULUS. — A first course in the subject, with some of the more important applications. Davis's "Differential and Integral Calculus." Prerequisites, Mathematics 1, 2, 3, 4 and 7. Primarily for juniors; 5 hours. Credit, 5.

Assistant Professor DUNCAN.

10. ROADS AND RAILROADS. — Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Text-book and lectures; 6 hours. Credit, 5.

Professor OSTRANDER.

11. **HYDRAULICS AND SANITARY ENGINEERING.** — Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Text-book and lectures; 3 hours. Credit, 3.

Professor OSTRANDER.

12. **ELEMENTARY STRUCTURES.** — An elementary course in roofs and bridges. Text-book and lectures; 6 hours. [Not given in 1915-16.] Credit, 5.

Professor OSTRANDER.

13. **MATERIALS OF CONSTRUCTION, FOUNDATIONS AND MASONRY CONSTRUCTION.** — Text-book and lectures; 4 hours. [Not given in 1915-16.] Credit, 3.

Professor OSTRANDER.

15. **APPLIED MECHANICS.** — A course in applied mechanics, based on the calculus, with problems. Text-books and lectures. Prerequisite, Mathematics 8. Three hours. Credit, 3.

Professor OSTRANDER.

MICROBIOLOGY.

Professor MARSHALL, Associate Professor VAN SUCHTELEN, Mr. ITANO, Mr. AVERY.

[Courses 1 and 3 (repeated in 2 and 4) are especially adapted to those who wish a general, comprehensive, although elementary, survey of agricultural microbiology.]

Elective Courses.

1. **MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — Types of micro-organisms, technic of handling, methods of culture and functions of micro-organisms are considered. This course is elementary and fundamental to all applied and special microbiological studies, and therefore is made a prerequisite to all courses offered; 2 hours or 2 credits are assigned to lectures, text-book requirements and recitations; this time will be scheduled. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 5.

The DEPARTMENT.

2. As stated under Course 1, which it repeats.

3. **AGRICULTURAL MICROBIOLOGY.** — This general comprehensive course is designed to cover in an elementary manner those subjects only which confront the student of general agriculture, — the microbiological features of air, water, sewage, soil, dairy, fermentations, food, vaccines, antisera, microbial plant infections, methods and channels of infections, immunity and susceptibility, microbial infections of man and animals, methods of control or sanitary and hygienic practices. These subjects will be demonstrated by illustrative and typical laboratory exercises, which for each subject, on account of time limitations, must be very elementary and greatly restricted. Prerequisite, Microbiology 1 or 2. Two hours or 2 credits are assigned to lectures, text-book requirements and recitations; this time will be scheduled. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 5.

The DEPARTMENT.

4. As stated under Course 3, which it repeats.

5. **ADVANCED MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.** — The purpose of this course is to prepare the student for a more intimate knowledge of microbiological agricultural problems. To accomplish this object it is necessary to provide more advanced technic and methods of culture, together with a more extensive knowledge of micro-organisms and their functions. Prerequisites, Microbiology 1 or 2, 3 or 4, and Chemistry 5 and 6. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors in the fall and spring semesters. Credit, 3.

The DEPARTMENT.

6. As stated under Course 5, which it repeats.

7. **ADVANCED AGRICULTURAL MICROBIOLOGY.** — A knowledge of the subjects mentioned in Courses 3 and 4 cannot be obtained without a more extensive training in microbiological practices, as found in Courses 5 and 6. Prerequisites, Microbiology 1 or 2, 3 or 4 and 5 or 6, and Chemistry 5 and 6. Six hours or 3 credits are assigned to the laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors in the fall and spring semesters. Credit, 3.

The DEPARTMENT.

8. As stated under Course 7, which it repeats.

9. **SOIL MICROBIOLOGY.** — Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth, food, reaction, temperature, moisture and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

10. As stated under Course 9, which it repeats.

11. **DAIRY MICROBIOLOGY.** — Special emphasis will be placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a passing survey of the microbiology of cheeses; a study of special dairy products, as ice cream, condensed milk, artificial milk drinks (the products of microbial actions), represents a list of topics considered. Prerequisites, Microbiology 1 or 2, and Dairying 1 (see Dairying 3). Six hours or 3 credits are assigned to laboratory exercises; only 1 hour of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

12. As stated under Course 11, which it repeats.

13. **FOOD MICROBIOLOGY.** — A study of food preservation by means of drying, canning, refrigerating and addition of chemicals will be pursued. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., will be examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased foods, will receive consideration. Contamination of food supplies by means of water, handling, exposure, diseased persons, etc., is of especial significance and will be demonstrated by laboratory exercises. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

14. As stated under Course 13, which it repeats.

15. **HYGIENIC MICROBIOLOGY.** — An attempt will be made to select for this course certain material which should be the possession of every individual, and which is basic to public hygiene and sanitation, as applied to man and animals. The microbiology of water supplies, food supplies, vaccines, antisera or antitoxins; the channels by which micro-organisms enter the body, the influence of body fluids and tissues upon them, body reactions with micro-organisms (susceptibility and immunity); the micro-organisms of some of the most important infectious diseases, methods of control, including disinfectants and disinfection, antiseptics, antisepsis and asepsis will be treated. Prerequisite, Microbiology 1 or 2. Six hours or 3 credits are assigned to laboratory exercises; only 1 of the 6 is scheduled; the remaining 5 hours are arranged with the instructor. Open to juniors and seniors. Credit, 3.

The DEPARTMENT.

16. As stated under Course 15, which it repeats.

PHYSICS.

Professor HASBROUCK, Assistant Professor ROBBINS, Mr. THOMPSON.

[The fundamental and basic importance of the laws and phenomena of physics makes necessary no explanation of the introduction of this subject into the curriculum of an agricultural college. The logical development of the subject emphasizes the importance of physics as a science in itself. Special emphasis is laid, however, on the correlation of the principles studied with the sciences of agriculture, botany, chemistry, zoölogy, thus furnishing an extra tool by use of which the student's work in all the subjects may be more effective.]

Required Course.

1. **GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS, WAVE MOTION AND HEAT.** — The following topics are chosen for the required work because they are regarded as the most fundamental of all, and there is no part of the work in physics more necessary for the student who plans to take up practical farming: Statics, with equilibrium of rigid body, work, energy and friction; kinetics, considering rectilinear motion and motion in a curved path; harmonic motion; rotation of rigid bodies, including kinematics of rotation; liquids and gases, with properties of fluids at rest and in motion; properties of matter and its internal forces, including elasticity, capillarity, surface tension; heat, including thermometry, calorimetry and specific heat, transmission of

heat, changes of state, radiation and absorption. Course given by text-book and lectures. Sophomores; 4 hours class-room work and 1 laboratory period. Credit, 5.

Professor HASBROUCK, Assistant Professor ROBBINS and Mr. THOMPSON.

Elective Courses.

2. GENERAL PHYSICS: ELECTRICITY AND LIGHT. — The work in electricity includes such subject-matter as magnetism, electrostatics, electric currents with their production, chemical, heating and mechanical effects; battery cells, measurement of voltage, current flow and resistance, motors and generators. In "light" there is included photometric measurements of the intensity of light, refraction, reflection and dispersion of light, lenses, prisms and optical instruments; analysis of light and polarization. Text-book, lectures, recitations and laboratory work. Sophomores; 2 hours of class-room work and 1 laboratory period. Credit, 3.

Assistant Professor ROBBINS and Mr. THOMPSON.

3. ELECTRICITY, HEAT AND LIGHT. — Three-hour lecture and laboratory course open to juniors and seniors; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3.

Assistant Professor ROBBINS.

4. Continuation of Course 3, open to juniors and seniors; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3.

Assistant Professor ROBBINS.

[Mathematics 4 (trigonometry) is, for convenience of grouping, listed under mathematics, although in charge of the Department of Physics.]

VETERINARY SCIENCE.

Professor PAIGE, Associate Professor GAGE.

[The courses in veterinary science have been arranged to meet the needs of students who propose following practical agriculture, and of prospective students of human and comparative medicine.]

Elective Courses.

1. VETERINARY HYGIENE AND STABLE SANITATION. — This course is intended to familiarize the student with the relation of water, food, air, light, ventilation, care of stables, disposal of excrement, individual hygiene, etc., to the prevention of disease in farm animals. Juniors and seniors; 3 hours. Credit, 3.

Professor PAIGE.

2. GENERAL VETERINARY PATHOLOGY, MATERIA MEDICA AND THERAPEUTICS. — In this course such fundamental and general pathological conditions are studied as inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the diagnosis, prevention and treatment of disease. The course in pathology is followed by one in materia medica and therapeutics, dealing with the origin, preparation, pharmacology, pharmacy, administration and therapeutic use of the more common drugs. Poisonous plants and symptoms and treatment of plant poisoning are also considered. Juniors and seniors; 3 hours. Credit, 3.

Professor PAIGE.

3. COMPARATIVE (VETERINARY) ANATOMY. — The anatomy of the horse is studied in detail, and that of other farm animals compared with it where differences exist. This course is essential for those students wishing to elect Course 4. Juniors and seniors; 3 hours. Credit, 3. Professor PAIGE.

4. THEORY AND PRACTICE OF VETERINARY MEDICINE; GENERAL, SPECIAL AND OPERATIVE SURGERY. — A course intended to familiarize the student with the various medical and surgical diseases of the different species of farm animals. Particular attention is given to diagnosis and first-aid treatment. The student is taught the technic of simple surgical operations that can with safety be performed by the stock owner. This course should be preceded by Course 3, and taken in conjunction with Course 2. Lectures, demonstrations and practice. Juniors and seniors; 3 hours. Credit, 3.

Professor PAIGE.

5. ESSENTIALS OF GENERAL PATHOLOGY. — This course is planned to introduce the student to some of the essential anatomical, histological and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis will be considered in the laboratory. The various chemical and biological reactions and tests will be presented from the standpoint of pure science, showing applications of chemistry and biology. The course will serve to liberally educate and stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration and laboratory work. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3.

Associate Professor GAGE.

6. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY. — This is a continuation of Course 5, and is devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease will be considered. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3.

Associate Professor GAGE.

7. AVIAN PATHOLOGY. — A course in poultry diseases. The object of this course is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. The work will consist of a systematic study of the diseases of the alimentary tract, liver and abdominal region, followed by a study of the diseases of the respiratory system, circulation and kidneys. The important disease-producing external and internal parasites will be considered; also diseases of the skin and reproductive organs. Lectures and demonstrations. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3.

Associate Professor GAGE.

8. AVIAN PATHOLOGY. — A continuation of Course 7, devoted to the study of some of the special diseases of poultry. Recent methods used in the control

of these diseases will be considered and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations and laboratory work. Juniors and seniors; 2 3-hour laboratory periods. Credit, 3. Associate Professor GAGE.

ZOÖLOGY AND GEOLOGY.

Associate Professor GORDON, Mr. BLANCHARD.

ZOÖLOGY.

Required Course.

1. **ELEMENTARY ZOÖLOGY.** — This course presents the underlying principles of biology and the zoölogical part of an introductory course. Laboratory dissection and lectures. Sophomores; 1 lecture hour and 2 2-hour laboratory periods. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

Elective Courses.

3. **INVERTEBRATE OR VERTEBRATE ZOÖLOGY.** — These are separate courses running throughout the year. The student may elect one or the other, but not both in the same year. The course in invertebrate zoölogy is designed primarily for students who are planning to take up entomology, but is open to any one. The course in vertebrate zoölogy deals with comparative vertebrate anatomy and physiology and is designed for those who desire or require a knowledge of the comparative anatomy and physiology of vertebrated animals. Each course includes laboratory, text-book and lecture work. These courses are scheduled in the junior year, but are open to seniors; hours by arrangement. Credit, 3. Associate Professor GORDON.

4. **INVERTEBRATE OR VERTEBRATE ZOÖLOGY.** — The continuation and completion of Course 3 of the first semester; hours by arrangement. Credit, 3. Associate Professor GORDON.

5. **ELEMENTS OF HISTOLOGY.** — This course gives the theories and methods of preparing normal animal tissues for microscopic examination. Chiefly laboratory work, with reading and occasional seminars. Open to juniors and seniors; hours by arrangement; see below, Course 6. Credit, 2.

Mr. BLANCHARD or Associate Professor GORDON.

6. **ELEMENTS OF HISTOLOGY.** — In Course 6 the student may carry forward the work of the first semester, thereby completing a year's work, or may take the work outlined for Course 5. Open to juniors and seniors; hours by arrangement. Credit, 2.

Mr. BLANCHARD or Associate Professor GORDON.

7. **ADVANCED ZOÖLOGY.**¹ — Special elective work in advanced zoölogy is offered to seniors who are interested in zoölogy or who are looking forward to advanced work in any department of zoölogy or allied branches; hours by arrangement. Credit, 5.

Associate Professor GORDON and Mr. BLANCHARD.

8. ADVANCED ZOÖLOGY.¹ — This course may be a continuation of the work of the first semester or of separate character; hours by arrangement. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

GEOLOGY.

Elective Course.

2. ELEMENTARY GEOLOGY. — Rock-forming minerals; rock types; rock weathering; dynamical, structural and surface geology. Lectures, map and field work. Sophomores; 1 1-hour period and 2 2-hour periods. Credit, 3.

Associate Professor GORDON and Mr. BLANCHARD.

¹ The work offered in Courses 3, 4, 7 and 8 may apply on a minor for the degrees of master of science or doctor of philosophy.

DIVISION OF THE HUMANITIES.

Professor SPRAGUE.

ECONOMICS AND SOCIOLOGY.

Professor SPRAGUE.

[The courses in economics and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.]

Elective Courses.

1. **POLITICAL ECONOMY.** — An introductory course which takes up the study of the nature and scope of economics, the evolution and organization of the present economic system, and the fundamental principles of production, exchange and consumption. The class will study and discuss such topics as wealth, value, capital, interest, profits, wages and labor, tariffs, trusts, etc. Debates on current economic problems will be organized in the class. Text-book, library readings, lectures and discussions. Arranged primarily for juniors; open to seniors; 3 hours. Credit, 3. Professor SPRAGUE.

2. **INDUSTRIAL PROBLEMS.** — This is a course in the most important industrial problems of the day, covering the methods of organizations of labor and capital, systems of industrial remuneration, means of securing industrial peace, legal status of labor unions and their activities, protective legislation for workmen and employers, the problems of immigration, the sweated industries, prison labor, child labor and industrial education. Text-book, with collateral readings, lectures and discussion. Three hours. Credit, 3.

Professor SPRAGUE.

4. **ANTHROPOLOGY; THE HISTORY OF HUMAN CIVILIZATION.** — The evolutionary origin and history of man; characteristics of primitive men, departure from the animal status, and the beginnings of civilization; development of industries, arts and sciences; the growth of languages, warfare, migrations and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern conditions; characteristics of the leading races of the world. These topics will constitute the subject-matter of the course. Arranged for sophomores and juniors; library readings, text-book and lectures; 3 hours. Credit, 3. Professor SPRAGUE.

5. **PUBLIC FINANCE, MONEY AND BANKING.** — This course follows Economics 1. It will take up taxation and the various systems for collecting public revenue in Europe and America, with the problems involved; the history of money and the systems of banking and finance now in operation; the cause and problems of economic crises and depressions; the currency problems of the United States. For juniors and seniors; readings, lectures and discussions; 3 hours. Credit, 3. Professor SPRAGUE.

7. **SOCIAL INSTITUTIONS AND SOCIAL PROBLEMS.** — This course is devoted to the study of the social institutions, such as the family, the church, State

and property; and to such current social problems as divorce, race suicide, crime and prison reform, poverty and its relief. Considerable time is given to the study of eugenics in its social significance and possibilities. The correctional and charitable institutions of Massachusetts are studied in some detail. The later weeks of the term are devoted to a short introduction to sociological theory. Arranged especially for seniors; open to juniors by permission; readings, lectures, discussions; 3 hours. Credit, 3. Professor SPRAGUE.

8. MODERN SOCIAL REFORM MOVEMENTS. — The history of property and its vital issues in modern times; the socialistic systems, anarchy and communism; systems of workingmen's insurance in Europe and America, and other methods of relief from the chances of life; educational reforms, in process, to meet the demands of a new age, and legislative remedies for the evils of social change and maladjustment; the crisis of Christianity under modern capitalized industrialism. These topics indicate the nature of the subjects studied. This course is arranged to follow Economics 7. Three hours. Credit, 3.

Professor SPRAGUE.

HISTORY AND GOVERNMENT.

Elective Courses.

1. ELEMENTS OF POLITICAL SCIENCE. — Nature and scope of political science; origin and evolution of the State; systems of government in the principal European States; organization and working of the national and of the State governments of the United States; relation of government to political parties and to public opinion; the functions of government as related to labor and commerce. [Withheld in 1915-16.] Three hours. Credit, 3.

2. LOCAL POLITICAL INSTITUTIONS. — A comparative study of the organization, functions and achievements of country and city groups, especially as these are concerned with such matters as taxation, finance, licenses, franchises, public ownership, highways, transportation and communication, water supply, fire protection, public lighting, markets, food inspection, garbage and sewage disposal, infectious diseases, housing conditions, police force, parks and playgrounds, libraries, schools, care of dependents. [Not given in 1915-16.] Three hours. Credit, 3.

3. THE HISTORY OF NEW ENGLAND. — This course, treating New England as a unit, aims to give a survey of its political, religious and economic history; to trace the development of its institutions, the growth of its industries, and its influence in national politics and upon the newer sections of the United States. Assigned readings and themes. Juniors and seniors. Three hours. Credit, 3.

5. THE HISTORY OF IDEALS. — This course treats history from the idealistic rather than from the economic point of view. It attempts to define the great ideals which have impelled some of the most important social,

¹ Given in 1915 by Miss Jefferson.

political, esthetic, scientific, ethical and religious movements of medieval and modern history, and to trace the causes of the success or failure of the movements to which these ideals have led. Christianity, including monasticism, modern Catholicism and Protestantism; medieval art and architecture; the modern scientific movement; and social and political democracy will be treated historically from this point of view. [Withheld in 1915-16.] Lectures and reading. Three hours. Credit, 3.

LANGUAGES AND LITERATURE.

Professor LEWIS, Associate Professor NEAL, Associate Professor ASHLEY, Associate Professor MACKIMMIE, Assistant Professor SMITH, Assistant Professor PRINCE, Miss GOESSMANN, Mr. HARMOUNT, Mr. JULIAN, Mr. RAND.

ENGLISH.

Required Courses.

1, 2. FRESHMAN ENGLISH. — Composition. Recitations, laboratory practice and lectures; theme writing and conferences. Text-book and laboratory manual, Neal's "Thought-Building in Composition." Freshmen; 4 hours. Credit, 4.

Assistant Professor SMITH, Assistant Professor PRINCE and Mr. RAND.

3, 4. SOPHOMORE ENGLISH. — A general reading course in English literature. Prerequisite, Courses 2 and 3, respectively. Sophomores; 2 hours. Credit, 2.

Professor LEWIS and Miss GOESSMANN.

Elective Courses in English Language and Literature.

[The elective courses in English fall into two groups. Both groups are intended to increase the student's appreciation of literature as a means to enjoyment, education and spiritual growth. Group one (Courses 11, 12, 13 and 14) will, besides introducing the student to individual writers, emphasize the life and thought of the times, political, economic and social, in order that the student may realize literature as the expression of individual genius representing (by leading it or summarizing it) the thought and spirit of a period or a social unit. Group two (Courses 15 and 16) will tend more to emphasize form-characteristics, artistic quality or historical development of literary types, or individual great writers. Courses 12, 13A, 14A, 15A and 16 are offered in 1916-17; courses 11A, 12, 13B, 14B, 15B and 16 are offered in 1915-16 and 1917-18.]

11. ENGLISH WRITERS AND THOUGHT. — A. *From Milton to Pope* (fall of 1915, 1917). — A survey course. It begins with a brief review of the Elizabethan period, and then considers the period of Milton (Caroline literature — Puritanism, the civil wars, Cromwell and the Protectorate), followed by the rapidly changing political and social conditions of the Restoration and then of the Revolution, ending with the Augustan age and Pope, and the temporary predominance of classicism and the intellectual instead of emotional qualities in literature. It will, however, emphasize the leading writers of the periods, including Bacon, Milton, Dryden, Addison and the essayists, Swift and Pope. Much of the literature of these times is closely associated with interesting and most important events in English political, religious and social history that introduce and explain the later modern periods. Juniors and seniors; every second year; 3 hours. [Not given in 1915-16.] Credit, 3.

Assistant Professor SMITH.

B. [Withheld.]

12. AMERICAN WRITERS AND THOUGHT. — Intended to give a general survey of literature in America, especially in the nineteenth century, with an introduction to the work of the best-known writers, and with especial attention to the relations between national life and history and national thought as expressed in literature. The usual authors — Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Parkman, Lowell, Holmes, Whitman, Lanier — will be discussed, and attention will be given to southern and western authors. Present writers and tendencies will also receive notice. Juniors and seniors; 3 hours. [Omitted, 1915-16.] Credit, 3.

Assistant Professor PRINCE.

13. ENGLISH WRITERS AND THOUGHT. — A. *Verse from 1744 to 1832* (fall of 1914, 1916). — A course in history, appreciation and understanding. Between the years named we see the rapid decline in formalism and a rapid increase of originality, freedom and emotional quality in literature (romanticism), accompanying the appearance in England of liberalism, industrial development, more general education and the spread of the ideals of democracy, and influenced also by Continental thought, especially the spirit of the French Revolution. This is the time in which England entered definitely upon that period of modern struggle, change and reorganization which is to be seen still continuing in contemporary affairs. Some of the writers belonging to it are Thomson, Collins, Gray and Cowper, Goldsmith, Chatterton, Blake, Crabbe, Burns, Coleridge, Wordsworth, Keats, Shelley, Scott and Byron. Juniors and seniors; alternates with Course B; 3 hours. Credit, 3.

Assistant Professor SMITH.

B. *Prose from 1744 to 1832* (fall of 1915, 1917). — A course in English prose paralleling Course A, which see. Some of the writers belonging to the period are Johnson, Sterne, Goldsmith, Burke, Miss Burney, Coleridge, Landor, Lamb, De Quincey and Hazlitt. The political essayists and the reviews will receive attention, but prose writers whose principal work was done in the novel will not be emphasized (see Course 15). Juniors and seniors; alternates with Course A; 3 hours. [Not given in 1915-16.] Credit, 3.

Assistant Professor SMITH.

14. ENGLISH WRITERS AND THOUGHT. — A. *Nineteenth Century Verse* (spring of 1915, 1917). — In general conception this course is like Course 13, which see. It begins with literature under the economic and social conditions of Victorian England, involving the advance of democracy, the spread of knowledge and culture, the advance of science, and the increase of industrialism, accompanied somewhat by materialism. The literature of the period takes new forms and directions; among its characteristics is an earnest endeavor to interpret ideals to a vastly increased and incompletely prepared reading public ("social service"). Tennyson, Browning, Mrs. Browning, Arnold, the Rossettis and Morris, Swinburne and Clough are among its noteworthy authors. Contemporary verse-writers will receive some notice. Juniors and seniors; alternates with Course B; 3 hours. Credit, 3.

Professor LEWIS.

B. *Nineteenth Century Prose* (spring of 1916, 1918). — This course parallels Course A, which see. Among the writers discussed will be Macaulay, Carlyle,

Ruskin, Newman, historians (*e.g.*, Froude) and essayists (*e.g.*, Pater, Arnold and Symonds). Fiction writers are given little attention (see Course 15), but contemporary writers of other prose will be given some notice. Juniors and seniors; alternates with Course A; 3 hours. Credit, 3. Professor LEWIS.

15. PROSE FICTION. — A. *The Novel* (fall of 1914, 1916). — Readings, references, reports and class-room talks. The course is mainly informal. Among the results that may follow the study of the novel are: (a) a sense of critical method, springing from the consideration of historical development and of types; (b) a deepened humanism, consequent on the study of acts and motives of men and the influences that modify them; (c) increased appreciation of artistic method and form; and (d) acquaintance with a kind of literature that has grown into great importance through the popularizing of science, the downward extension of learning, and the democratizing of society. Juniors and seniors; alternates with Course B. Credit, 3. Associate Professor NEAL.

B. *The Short Story* (fall of 1915, 1917). — Readings, references, reports and class-room talks. The course is mainly informal. General texts, Neal's "Short Stories in the Making" and "To-day's Short Stories Analyzed." Particular results that may be obtained from short-story study are: (a) self-culture, the short story being well adapted to stimulate the literary, dramatic and imaginative faculties; and (b) acquaintance with that type in which American literature has especially succeeded. Juniors and seniors; alternates with Course A. Credit, 3. Associate Professor NEAL.

16. THE DRAMA AND SHAKSPERE. — The source, technique and development of drama, accompanied by a study of Shakspeare, his mind, manner and technique. The minor Elizabethan dramatists, their influence on Shakspeare, and Shakspeare's influence on later writers, will be considered, as will the English social and industrial conditions of the time, their causes and their influence on Shakspeare and his fellow writers. Extensive reading, analysis and interpretation of his comedies, tragedies and histories, and of modern dramatists is included. Juniors and seniors; every year; 3 hours. Credit, 3. Assistant Professor SMITH.

RURAL JOURNALISM.

[The courses in journalism emphasize rural journalism. They aim to acquaint the student with the elementary problems and theory of journalism as a profession or vocation, and to exercise him, as far as conditions permit, in the commoner aspects of journalistic work, such as news-gathering, news-writing, desk-editing and editorial writing. By rural journalism is meant the application of journalistic principles in getting and suitably presenting material adapted to the non-urban rather than to the urban or metropolitan reader, so far as their interests are distinct. This includes agricultural journalism, but is by no means confined to that. As practical work, members of the classes supply "The Bay State Ruralist," a feature page for the "Springfield Sunday Union." Members of all classes, except in Courses 1, 2 and 5, are subject to the following requirements: (1) preparation of all copy in typewriting in the news room (laboratory); (2) recopying in corrected form of copy after editing, or rewriting of stories under direction; (3) reading regularly of a daily newspaper and of a weekly periodical; (4) turning in weekly a specified number of suggestions for news stories or other articles.]

Elective Courses.

1. FOUNDATIONS OF WRITING: EXPOSITION. — Advanced composition; planning expository thought; expository structure; analysis of specimens, including contemporary articles from farm and rural life publications, bulletins,

etc.; some bulletin writing, including presentation of technical information for nontechnical readers. Juniors and seniors. Credit, 3.

Assistant Professor PRINCE.

2. FOUNDATIONS OF WRITING: NARRATION AND DESCRIPTION. — The fundamental elements of style, word-choice, diction, sentence form and paragraph types. Description of persons, places, objects, industries and productional processes, the temper and characteristic aspects of public gatherings, moods, behavior and character-sketching. Narration of incident, sustained action, events in series and the like, as in biography, dramatic situation, history and fiction. Juniors and seniors. Credit, 3. Associate Professor NEAL.

3. NEWS-GATHERING AND NEWS-WRITING. — The foundation aims and conceptions of journalism. Readings, lectures, quizzes and personal conferences; reporting on runs and on assignment; regular reading of a daily paper and of a weekly review or farm journal, with reports thereon. The central purpose is to develop ability to pick out essentials from inessentials, perceive elements of interest, and present facts with appeal to the reader. (Further practice is provided in Courses 9 and 10.) Though given somewhat informally, the year's work will bring before the student such subjects as these: City and rural newspapers, class and trade journals, reviews, magazines. Journalistic style. Nature, classes and tests of news. News values. Form of the news story; lead and feature. Stories not primarily news; feature and human-interest stories, etc. News sources; runs, assignments, correspondents. News in the home community; farm reporting; employment of news to develop home interests. This course and Course 4 are recommended to students whose vocation will require the popular presentation of technical or other information; *e.g.*, extension workers, county agents, agricultural school instructors, experiment-station editors, survey and other social service workers, men engaged in sociological or economic investigations, landscape architects, and civil and sanitary engineers. Students desiring practice in the writing of special, magazine and feature articles might find this course adapted to their purpose. Juniors and seniors. Credit, 2.¹

Associate Professor NEAL.

4. NEWS-GATHERING AND NEWS-WRITING. — As outlined under Course 3, except that students who have taken Course 3 will be assigned different readings and may be given a larger amount of reporting or other writing.

5. DESK EDITING. — A technical course for men professionally interested in journalism. Revision and rewriting; writing from another's notes; copy-reading, proof-reading, headline writing. Laboratory course. Seniors and juniors. Credit, 1. Associate Professor NEAL.

7. EDITORIAL MATERIALS AND METHODS. — Readings, quizzes, reports and personal conferences; regular reading of one daily paper and one weekly review or rural life periodical; writing of editorial articles; current events.²

¹ It is proposed to make this a 3-credit course after 1915-16.

² The addition of readings to afford an outline of recent modern history is proposed. It would add 1 to the number of credits.

Though given somewhat informally, the year's work will bring before the student such subjects as these: Editing as interpretation and as executive direction; the urban, the agricultural and the rural editor; relation of the editor to his community; editorial organization. The business side of editing. The newspaper as a public utility; its relations to community welfare. Editorial subjects and writing; sources of information; rural topics and their interpretation. Recommended to non-majoring students who desire practice in discovering the significant aspects of matters of public attention and in effectively expressing thought thereon. Laboratory course. Seniors and juniors. Credit, 2.

Associate Professor NEAL.

8. EDITORIAL MATERIALS AND METHODS. — As outlined under Course 7.

9, 10. ADVANCED JOURNALISTIC PRACTICE. — Preparation, editing and publication of a rural life page or periodical. Members of the class are expected to make several trips to "The Springfield Union" offices on days when "The Bay State Ruralist" page is making up, and individual students may sometimes be placed in charge of the make-up. Recommended (like Courses 3 and 4) to students interested in writing special, magazine and feature articles. Primarily a senior course. Credit, 3.¹

Associate Professor NEAL.

PUBLIC SPEAKING.

Required Courses.

1, 2. FRESHMAN PUBLIC SPEAKING. — Freshman public speaking is required in either the first or the second semester at the option of the instructor. The course is concerned with the actual problems which confront the man who would speak convincingly and persuasively. Some attention is given to breath control and development of speaking voice, considerable attention to pronunciation and enunciation, and a large amount of attention to the preparation and delivery of extempore speeches. Text-book, Shurter's "Extempore Speaking," supplemented by lectures and discussions. Freshmen; in semester 1 or 2 as directed; 1 hour. Credit, 1.

Assistant Professor PRINCE and Mr. RAND.

Elective Courses.

7. DEBATING. — Considerable time is given to the study of argumentation and brief-drawing. The class is divided into teams for the platform discussion of leading questions of the day. This course is designed to develop readiness in extempore speaking. It is recommended for those who desire to enter the intercollegiate debates. Prerequisite, Course 2. Two hours. Credit, 2.

Assistant Professor SMITH.

8. OCCASIONAL ORATORY. — Exercises for voice and gesture; a study of the elements of vocal expression and action; speeches on assigned topics; prescribed reading; the preparation and delivery of a formal oration or two. It is especially recommended for those who desire to enter the Flint contest. Two hours. Credit, 2.

Assistant Professor SMITH.

¹ An increase of credits to 4 is proposed for next year.

FRENCH AND SPANISH.

Associate Professor MACKIMMIE, Mr. HARMOUNT.

FRENCH.*Required Courses.*

1, 2. **ELEMENTARY FRENCH.** — The essentials of grammar are rapidly taught, and will be followed by as much reading as is possible. This course is required of freshmen presenting German for entrance who do not continue that language and have not studied French; open upon arrangement to other students. Freshmen; 4 hours. Credit, 4. Mr. HARMOUNT.

3. **INTERMEDIATE FRENCH** (third year). — Training for rapid reading; the reading of a number of short stories, novels and plays; composition; reports on collateral reading from periodicals and scientific texts in the library. Required of freshmen who present two years of French for entrance and do not take German, and of sophomores who take Courses 1 and 2 as freshmen; open upon arrangement to other students; 4 hours. Credit, 4.

Associate Professor MACKIMMIE and Mr. HARMOUNT.

4. **INTERMEDIATE FRENCH.** — As stated under Course 3, but not required of sophomores who take Courses 1 and 2 as freshmen. Prerequisite, Course 3. Associate Professor MACKIMMIE.

5. **ADVANCED FRENCH** (fourth year). — A reading course; Balzac's "Eugenie Grandet" and "Le Père Goriot" and other masterpieces of the nineteenth century; Brunetière's "Honoré de Balzac" and Harper's "Masters of French Literature;" readings in the library and written reports. Required of sophomores who take Courses 3 and 4 as freshmen; open upon arrangement to other students. Prerequisite, Course 4. Three hours. Credit, 3. Associate Professor MACKIMMIE and Mr. HARMOUNT.

Elective Courses.

6. **ADVANCED FRENCH** (fourth year). — A general view of the history of French literature; Kastner and Atkins' "History of French Literature." Several plays of the great classical dramatists will be read. Individual conferences on outside reading selected by the student. Prerequisite, Course 5. Sophomores; open upon arrangement to other students; 3 hours. Credit, 3. Associate Professor MACKIMMIE.

7, 8. **SCIENTIFIC FRENCH.** — This course is planned to meet the requirements of the individual student and aims to equip him with exact English equivalents for the French scientific terms in his particular science. Word lists of scientific terms will be required and also weekly readings and reports from scientific works in the subject in which he is majoring. Several scientific readers will be read. Three hours. Credit, 3. Mr. HARMOUNT.

9, 10. **MODERN FRENCH LITERATURE.** — The outline is intended as a suggestion. The exact subject-matter of the course will be determined when the men are enrolled. The object of this course is to give an introduction

to recent movements in French literature. In the drama, readings from Augier, A. Dumas, fils, Delavigne; in the novel, from Flaubert, the de Goncourts, Zola; in criticism, from Taine, Renan, Sainte-Beuve; for the literary history of the period Lanson's "Histoire de la Litterature Française." Prerequisite, the required French. Juniors or seniors; 3 hours. Credit, 3.

Associate Professor MACKIMMIE.

SPANISH.

Elective Courses.

1, 2. **ELEMENTARY SPANISH.** — Grammar, with special drill in pronunciation; exercises in conversation and composition. Reading from a reader and selected short stories. Intended primarily for juniors; open to other students upon arrangement; both semesters; 3 hours. Credit, 3.

Associate Professor MACKIMMIE.

3, 4. **MODERN SPANISH AUTHORS.** — Reading from modern Spanish novel and drama. Translation of English into Spanish. Private reading. Prerequisites, Courses 1 and 2. Intended primarily for seniors; 3 hours. Credit, 3.

Associate Professor MACKIMMIE.

GERMAN AND MUSIC.

Associate Professor ASHLEY, Mr. JULIAN.

GERMAN.

Required Courses.

1. **ELEMENTARY GERMAN.** — Grammar and composition; the reading of short stories, poems, plays, etc. Especial attention is given to oral questioning and answering in German, and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German. Arranged for freshmen; open by permission to other students; 4 hours. Credit, 4. Mr. JULIAN.

2. **ELEMENTARY GERMAN.** — As stated under Course 1. Prerequisite, Course 1.

3. **INTERMEDIATE GERMAN.** — Rapid reading of selected works from Schiller, Goethe, Lessing and others; review of grammar and dictation in German; outside readings. Required of freshmen who present German for entrance and do not take French. Freshmen; open upon arrangement to other students; 4 hours. Credit, 4. Associate Professor ASHLEY.

3A. **INTERMEDIATE GERMAN.** — Rapid reading of prose works, such as Sudermann's "Frau Sorge," and dramas, such as "Wilhelm Tell" and "Die Journalisten." Required of sophomores who took Courses 1 and 2 as freshmen. Mr. JULIAN.

4. **INTERMEDIATE GERMAN.** — As stated under Course 3. Prerequisite, Course 3.

4A. INTERMEDIATE GERMAN. — As stated under Course 3A. Open to students who have completed German 3A; 3 hours. Credit, 3.

5. ADVANCED GERMAN. — Literary study of the classicists, — Schiller's "Wallenstein," Lessing's "Nathan der Weise," Goethe's "Iphigenia," etc.; collateral readings in German and class-room reports. Prerequisite, Course 4. Sophomores; required of those who took German 3 and 4 as freshmen; open upon arrangement to other students; 3 hours. Credit, 3.

Associate Professor ASHLEY.

Elective Courses.

6. ADVANCED GERMAN. — As stated under Course 5. Sophomores; open upon arrangement to other students. Prerequisite, Course 5. Three hours. Credit, 3.

Associate Professor ASHLEY.

7. SCIENTIFIC GERMAN. — Reading in German of modern magazine articles and works of a scientific nature. Different work assigned according to needs of individual students. Open to juniors who have completed Course 4A or more advanced work; 3 hours. Credit, 3.

Associate Professor ASHLEY.

8. SCIENTIFIC GERMAN. — As stated under Course 7.

9. CONVERSATION AND COMPOSITION. — Translating connected English into German. Reproducing outside readings in German orally in class. One hour. Credit, 1.

Associate Professor ASHLEY.

10. MODERN GERMAN. — As stated under Course 9.

11. GERMAN LITERATURE. — Advanced language and literary study. Conducted entirely in German. Lectures on German literature and history; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as "Niebelungenlied," Goethe's "Faust," and one modern typical drama. Prerequisite, Course 6 or 10. Three hours. Credit, 3.

Associate Professor ASHLEY.

12. GERMAN LITERATURE. — As stated under Course 11.

MUSIC.

Elective Courses.

1. HISTORY AND INTERPRETATION OF MUSIC. — History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school — Bach, Händel, Haydn, Gluck and Mozart. One hour. Credit, 1.

Associate Professor ASHLEY.

2. HISTORY AND INTERPRETATION OF MUSIC. — A continuation of Course 1. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera. The Modern school and Modern composers. One hour. Credit, 1.

Associate Professor ASHLEY.

DIVISION OF RURAL SOCIAL SCIENCE.

President BUTTERFIELD.

AGRICULTURAL ECONOMICS.

Professor CANCE, Mr. READ, Mr. STRAND.

Required Course.

2. AGRICULTURAL INDUSTRY AND RESOURCES. — A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers' demand. The principal agricultural resources of the United States will be studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions. Sophomores; 3 hours. Credit, 3.

Professor CANCE, Mr. READ and Mr. STRAND.

Elective Courses.

3. ELEMENTS OF AGRICULTURAL ECONOMICS. — This course is designed to follow the required work in the elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; determination of price; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics and field work; 3 hours. Credit, 3.

Professor CANCE.

5. HISTORICAL AND COMPARATIVE AGRICULTURE. — Recommended to students in journalism or education. A general survey of agriculture, ancient and modern; feudal and early English husbandry; the later development of English agriculture; the course of agriculture in the United States, with special emphasis on the development of agriculture in New England. An attempt will be made to measure the influence of times, peoples and countries in producing different systems of agriculture, and to ascertain the causes now working to effect agricultural changes. Lectures, readings and library work. Seniors and juniors; open to other students upon arrangement; prerequisite, Course 3 or equivalent; 3 hours. [Not given in 1915-16.] Credit, 3.

Mr. STRAND.

6. CO-OPERATION IN AGRICULTURE. — The course treats of the history, principles and business relations of agricultural co-operation. (1) A survey of the development, methods and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, with particular

reference to credit and purchase and the marketing of perishable products. Lectures, text, assigned readings and practical exercises; 3 hours. Credit, 3.
Professor CANCE.

7. **THE AGRICULTURAL MARKET.** — A study of the forces and conditions which determine the prices of farm products, and the mechanism, methods and problems concerned with transporting, storing and distributing them. Supply and demand, course of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies and field work. Juniors, seniors and graduate students; 3 hours. Credit, 3.
Professor CANCE.

8. **PROBLEMS IN AGRICULTURAL ECONOMICS.** — An advanced course for students desirous of studying more intensively some of the economic problems affecting the farmer. Some of these are: land problems — land tenure, size of farms, causes affecting land values, private property in land, taxation of farm property; special problems — cost of producing farm products, farm labor in New England, immigration, agricultural credit. Opportunity will be given, if practicable, for field work, and students will be encouraged to pursue lines of individual interest. Graduate students, seniors and juniors; open to others on approval; 3 hours. Credit, 3.
Professor CANCE.

9. **SEMINAR.** — Research in agricultural economics and history: New England agriculture to 1860. Library work and reports. If desirable some other topic may be substituted. Hours to be arranged. Credit, 1.
Professor CANCE.

10. **SEMINAR.** — As stated in Course 9.

11. **TRANSPORTATION OF AGRICULTURAL PRODUCTS.** — This course will sketch the development of the transportation in the United States, covering highways, waterways, railways and electric ways with reference to the facilities for and cost of transporting farm products, opening up new agricultural areas or industries, and contributing to the wealth and welfare of the agricultural population. Lectures, text and field work. Juniors, seniors, graduate students, and others on approval; 3 hours. Credit, 3.
Professor CANCE.

AGRICULTURAL EDUCATION.

Professor HART.

Elective Courses.

1. **RURAL SCHOOL PROBLEMS.** — Primarily for teachers. A study of agricultural education; the theory and practice of teaching; rural school organization; methods of instruction; the place and function of agriculture in the course of study for both rural and city schools; planning and practical work in school and home gardens; planning of equipment and ornamentation of rural school grounds. One lecture period, and 2 2-hour laboratory periods. Credit, 3.
Professor HART.

2. As stated under Course 1.

3. MEANING OF EDUCATION (PSYCHOLOGY). — For teachers and others desiring an introduction to mental science. A study of the development, structure and functions of the nervous system and the sense organs; the development and nature of mental activities; the nature of the learning processes. Three lecture periods. Credit, 3.

Professor HART.

4. HISTORY AND PHILOSOPHY OF EDUCATION. — For teachers and others desiring an introduction to educational theories. A study of educational ideals and movements as exemplified by leading nations and races; the growth of educational institutions as influenced by science and industry; the history and meaning of industrial and agricultural education. Three lecture periods. Credit, 3.

Professor HART.

5. PROBLEMS IN RURAL EDUCATION. — For teachers or others interested in special phases of education, such as child development, physical and mental; school organization; rural schools; secondary schools; school programs; grading and promotion of pupils; school grounds and school architecture and equipment; normal schools and the preparation of teachers; agricultural teaching and agricultural schools. Two lecture periods. Credit, 2.

Professor HART.

6. As stated under Course 5.

7. GRADUATE COURSES. — See Graduate School.

9. EXTENSION AND COUNTY AGENT WORK. — The course consists chiefly of library research work. Each student will be required to produce one or more complete lectures under guidance both as to method of preparation and subject-matter, and one or more demonstrations. These lectures will be presented to public audiences in the presence of a board of critics. Some instruction will be given in organization and administration of the Extension Service. The Extension Service will be responsible for the public presentation and criticism. The student's major adviser will be responsible for the accuracy of the subject-matter. The Department of Agricultural Education will be responsible for the preparation of the lectures. One lecture and two laboratory periods. Credit, 3.

Professor HART.

10. As stated in Course 9.

RURAL SOCIOLOGY.

Professor PHELAN, President BUTTERFIELD, Professor HART, Miss GOESSMANN, Mr. LUND, Mr. BAIRD.

Elective Courses.

1. ELEMENTS OF RURAL SOCIOLOGY. — A broad survey of the field of rural sociology, including such topics as the origin of rural sociology, its methods and problems; relation of sociological to the scientific and technical aspects of agricultural problems; the development of the rural community in New England and the west, religious, educational and social ideals of rural people; characteristics and influence of the rural environment, the movement of the rural population, the effects of immigration; rural institutions, the school, the church, local government, effects of modern conditions of life on rural in-

stitutions; rural organization; problems of progress, an analysis of the needs of rural life in its further development. To be required of sophomores after 1915-16. Lectures, readings and essays on assigned topics; 3 hours. Credit, 3.

Professor PHELAN.

2. RURAL ORGANIZATION. — A study of the organized agencies by which rural communities carry on their various forms of associated life, particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment; principles underlying leadership, qualifications of the paid leader and the lay leader; the field of rural social service, national, State and local, preparation and opportunity for service; rural community building, a study of organized ways and means by which aid is given local communities. Three hours. Credit, 3.

President BUTTERFIELD.

3. THE LITERATURE OF RURAL LIFE. — A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities. Three hours. Credit, 3.

Miss GOESSMANN.

4. RURAL AND BUSINESS LAW. — The work of this course will cover such points as land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper and distinctions between personal and real property. Text, written exercises, lectures and class discussions; 3 hours. Credit, 3.

Professor HART.

5. RURAL GOVERNMENT. — A general survey of the development of rural government in the United States; origin of the New England town, its influence upon the west, advantages, development of efficiency, county government, the influence of the farmer in legislation, good roads movement, credit, facilities, taxation, boards of agriculture, agricultural colleges and experiment stations in relation to rural welfare; national government; a general survey of political organizations and movements among farmers in the United States and foreign countries and their influence in shaping legislation; relation of the Department of Agriculture, postal system, the various national commissions and agencies to rural welfare. Lectures, readings, written exercises on assigned topics; 3 hours. Credit, 3.

Professor PHELAN.

6. FIELD WORK IN RURAL SOCIOLOGY. — This course is designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work will be carried on in co-operation with the various college agencies engaged in rural service. Any project for which credit in this course is to be asked must first have the approval of the head of the department. Prerequisites, Courses 1 and 2. Credit, 1 to 3 hours, according to project.

7. THE SOCIAL PSYCHOLOGY OF RURAL LIFE. — Characteristics of the rural mind; character of hereditary and environmental influences; nature and effects of face-to-face groups; psychological effects of isolation, relative secur-

ity and freedom from strain; relation of contact with nature, of control over immediate environment, of family co-operation and of neighborhood life to self-control, self-expression, sympathy, service and leadership; nature and effects of fashion, conventionality and custom; character of discussion and public opinion, and their relation to class feeling and organization; relation of individualism, conservatism and homogeneity to crowd phenomena and progressive democracy. Three hours. Credit, 3. Professor PHELAN.

8. RURAL SOCIAL SURVEYS. — A careful study of the theory and function of statistics, the limitations and difficulties in the use of statistics, the interpretation of statistical data, various methods of graphic representation; a study of surveys, kinds and use, method of gaining information, the basis for conclusions, value of information gained. Text and lectures; 3 hours. Credit, 3. Professor PHELAN.

10. FARMERS' ORGANIZATIONS. — The history, purposes and achievements of the Grange, the Farmers' Union, farmers' clubs, village improvement associations, boys' clubs, etc.; the method, scope and history of local, State and national associations formed about some farm product, their influence in forming class consciousness and in shaping agrarian legislation; need of federation. Lectures, readings and essays on assigned topics; 3 hours. Credit, 3. Professor PHELAN.

11. SEMINAR.

12. SEMINAR.

GENERAL DEPARTMENTS.**MILITARY SCIENCE AND TACTICS.**

First Lieutenant H. W. FLEET, 19th Infantry, U. S. A.; Assistant: Ordnance Sergeant J. J. LEE, U. S. A., retired; Adjutant Assistant: Quartermaster Sergeant ALEX. SMART, U. S. A., retired.

[The Department of Military Science and Tactics conducts its work in conjunction with the Department of Physical Education and Hygiene, in accordance with the following statement: —

All candidates for a degree in a four-year course must take for three years three full hours a week of physical training. This work must be under college supervision. At least two years of the work must be taken in the Department of Military Science and Tactics, in accordance with the requirements of the War Department; the rest is to be taken in the Department of Physical Education.

. Under this arrangement, the practical (drill) courses in military science are given up to the Christmas recess and from the close of the spring recess to the end of the semester each year; the corresponding courses in physical education occupy the intervening time.

Under act of Congress (July 2, 1862), military instruction under a regular army officer is required in this college of all able-bodied male students. Men are excused from the exercises of this department only upon presentation of a certificate given by the college physician; minor disabilities which might bar enlistment are not considered. Students excused from military duty may be required to take equivalent work. The object of the instruction is to disseminate military knowledge in order that in emergency trained men may be found to command volunteer troops; but a further object is to give physical exercise, to teach obedience without detracting from self-respect, and to develop the bearing and courtesy that are as becoming in a citizen as in a soldier. Absences and other offenses of military nature, and those of which the military instructor may take cognizance as affecting discipline, are dealt with by the commandant in accordance with the regulations of the department; but delinquencies in theoretical instruction not strictly military in their nature are dealt with in accordance with the rules of the faculty.

Cadets in the graduating class who have shown special aptitude for military service are reported to the Adjutant-General of the United States army and to the Adjutant-General of Massachusetts; in making appointments from civil life to the regular or volunteer army, preference is given to those who have been so reported. The names of the three most distinguished are published in the "Official Register of the United States Army." Assignments to the band are made by the military instructor. Practice in the band is credited in place of drill and theoretical instruction.

The required uniform is of olive drab cloth, costing about \$17. It is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor. Students upon entering college are required to deposit \$17 with the college treasurer to cover the cost of the uniform. The sale of old uniforms is prohibited, unless the consent of the military instructor be obtained.]

Required Courses.

1. FRESHMAN DRILL. — Practical instruction in infantry drill regulations through the battalion. Ceremonies. First semester until Christmas recess; 3 hours. Credit, 1. Lieutenant FLEET.

2. FRESHMAN DRILL. — As stated under Course 1. Company training in bayonet exercises and physical exercises with and without arms; 3 hours. Credit, 1. Lieutenant FLEET.

3. FRESHMAN TACTICS. — Theoretical instruction in infantry drill regulations through the battalion and ceremonies. Lectures on military subjects and military history; 1 hour. Credit, 1. Lieutenant FLEET.

4. FRESHMAN TACTICS. — As stated under Course 3.

5. SOPHOMORE DRILL. — Practical instruction in field service regulations in the service of security and information. Corporals are appointed from this class. First semester until Christmas recess; 3 hours. Credit, 1.

Lieutenant FLEET.

6. SOPHOMORE DRILL. — As stated under Course 5; intrenching, combat.

7. SOPHOMORE TACTICS. — Theoretical instruction in map problems in security and information. Combat. Lectures on military subjects and military history; 1 hour. Credit, 1.

Lieutenant FLEET.

8. SOPHOMORE TACTICS. — As stated under Course 7.

9. JUNIOR DRILL. — Practical instruction in the small arms firing regulations in target practice, estimating distances and field firing. Lieutenants and sergeants are appointed from this class. First semester until Christmas recess; 3 hours. Credit, 1.

Lieutenant FLEET.

10. JUNIOR DRILL. — As stated under Course 9.

Elective Courses.

11. SENIOR DRILL. — Conduct drills of lower classes. Field officers and captains are appointed from this class. These officers are paid. The positions in every case are obtained by competition. It is to be understood that cadets obtaining these positions will be reported to the Adjutant-General of the army as distinguished cadets. First semester until Christmas recess; 3 hours. Credit, 1.

Lieutenant FLEET.

12. SENIOR DRILL. — As stated under Course 11.

PHYSICAL EDUCATION AND HYGIENE.

Associate Professor HICKS, Mr. GORE, Mr. FITZMAURICE.

HYGIENE.

Required Course.

1. HYGIENE. — Lectures, reading, quizzes and a report on some assigned topic of personal hygiene or sanitation. Freshmen; 1 hour. Credit, 1.

Associate Professor HICKS.

PHYSICAL EDUCATION.

[The Department of Physical Education conducts its work in physical training in conjunction with the Department of Military Science and Tactics, as explained in the note preceding the description of the courses in military science. All classified undergraduate students are given a physical examination upon entering.]

Required Courses.

1. ELEMENTARY GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 2. Freshmen; 3 hours. Credit (given only for Course 2), 1. Mr. GORE and Mr. FITZMAURICE.

2. ELEMENTARY GYMNASTICS. — As stated under Course 1.

3. GRADED GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 4. Sophomores; 3 hours. Credit (given only for Course 4), 1. Mr. GORE and Mr. FITZMAURICE.

4. GRADED GYMNASTICS. — As stated under Course 3.

5. GYMNASTICS. — Drills, games and athletics; from January 1 to April 1, in connection with Course 6. Juniors; 3 hours. Credit (given only for Course 6), 1. Mr. GORE and Mr. FITZMAURICE.

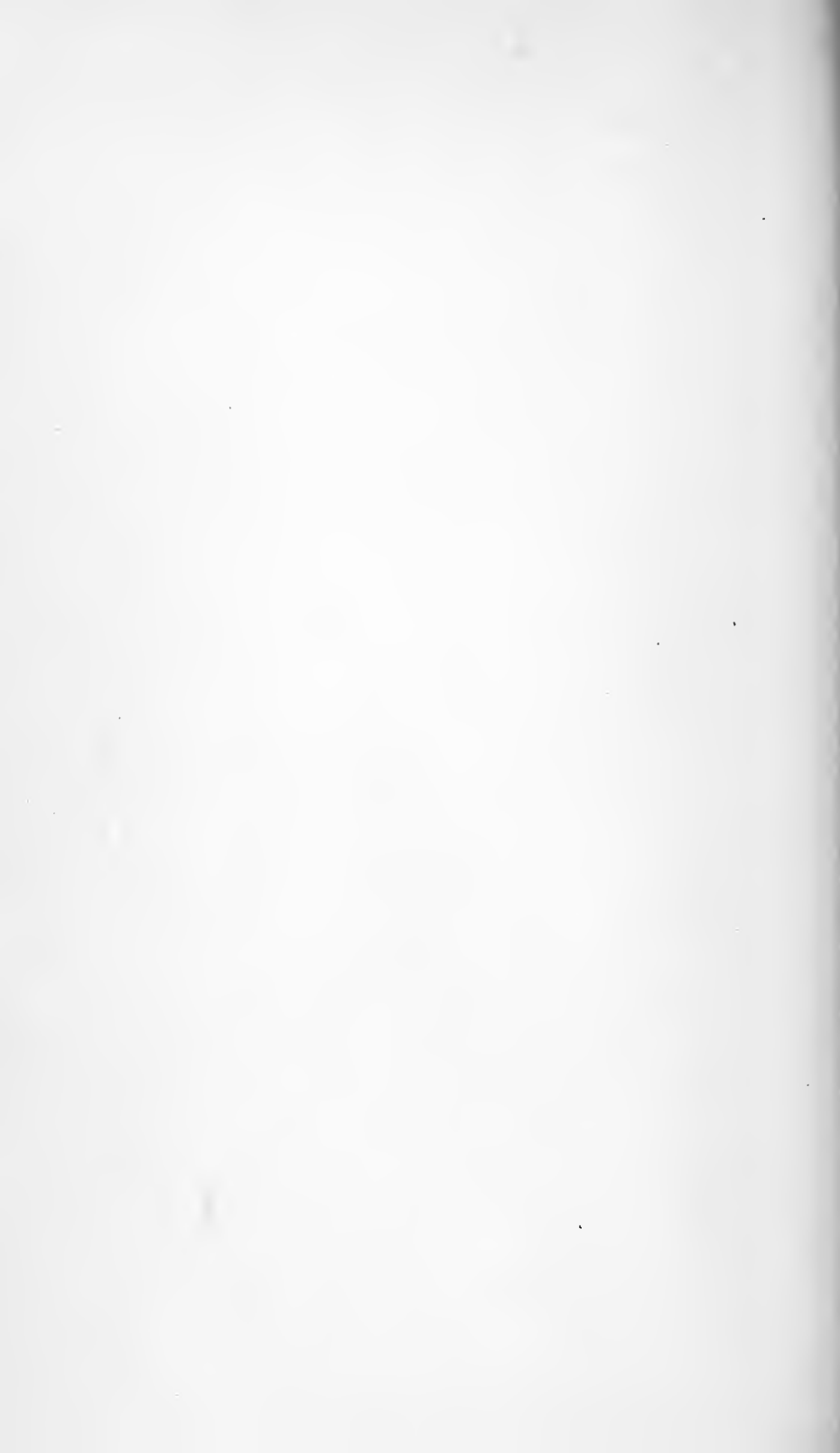
6. GYMNASTICS. — As stated under Course 5.

Elective Courses.

7. TRAINING COURSE. — History of physical education; supervision of indoor and outdoor athletic contests and games; athletic administration. Seniors; 3 hours. Credit, 1. Associate Professor HICKS.

8. TRAINING COURSE. — As stated under Course 7.

THE GRADUATE SCHOOL.



THE GRADUATE SCHOOL.

KENYON L. BUTTERFIELD, A.M., LL.D., President of the College.

CHARLES H. FERNALD, Ph.D., Honorary Director of the Graduate School.

CHARLES E. MARSHALL, Ph.D., Director of the Graduate School and Professor of Microbiology.

Graduate Staff, 1915-16: Associate Professor ANDERSON, Professor CANCE, Professor CHAMBERLAIN, Professor FERNALD, Professor FOORD, Associate Professor GORDON, Professor GRAHAM, Professor HART, Professor HASKELL, Professor LINDSEY, Mr. MORSE, Associate Professor OSMUN, Associate Professor PETERS, Professor PHELAN, Assistant Professor QUAIFFE, Professor SEARS, Dr. SHAW, Professor WAUGH, Director MARSHALL, President BUTTERFIELD; Mr. WATTS, Secretary.

Graduate courses leading to the degrees of master of science and doctor of philosophy have been given for a number of years; the degrees of master of agriculture and doctor of agriculture are now granted to meet strictly professional needs. The number of requests for each of these courses is apparently increasing. In recognition of the benefits to be derived from a separate organization, a distinct graduate school has been established for the purpose of fitting graduates of this and other institutions for teaching in colleges, high schools and other public schools; for positions as government, State and experiment-station specialists in farm management, dairying, live-stock husbandry, poultry science, agronomy, landscape gardening, pomology, vegetable gardening and floriculture; for positions as bacteriologists, botanists, chemists, entomologists; and for numerous other positions requiring a great amount of scientific knowledge, training and experience.

ORGANIZATION.

The school is based upon the department as the unit, and the apprenticeship system as the most effective means of instruction. This gives to the student individuality in treatment and an intimacy with actual conditions of work and operations. Besides, each student is assigned to an advisory committee, composed of the instructor in charge of his major subject as chairman, and instructors in charge of his minor subjects as members, which directs his graduate studies. The chairmen of all these committees together constitute the graduate staff, which controls the policy of the graduate school.

ADMISSION.

Admission to the graduate school will be granted:—

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work

in that subject as the professor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree, — students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership to the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and of the amount and kind of work already done by him as an undergraduate should be submitted, — together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

NATURE, METHODS AND REQUIREMENTS OF GRADUATE WORK.

Graduate work differs from undergraduate work in its purposes and methods. The primary aims of the instructor are emphasized in an attempt to have the student adjust himself and place himself in his environment; develop the rule of self-direction and self-instruction; acquire the power of accurate reasoning; gain proficiency and skill in his selected field of study or practice; and obtain an appreciative and discriminative insight into experimentation and original research. Methods are not devised, therefore, for attractiveness, entertainment and superficial reviews, but for the creation of initiative and profound thought, thorough acquaintance with detail, independent advance and industrious habits. Careful reading, lectures, conferences, surveys, laboratory exercises and field work are some of the agencies utilized.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as a major and the other as a minor. These subjects may not be selected in the same department. An original thesis is considered a part of the major subject.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major and the others as minors. No two of these subjects may be taken in the same department. An original thesis shall be considered a part of the major subject.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary properly to equip the individual professionally.

Candidates for the degree of doctor of agriculture are required to select a major and such other subjects as will develop the major in its greatest intensity and comprehensiveness. Successful experience is also requisite, together with a thesis which represents a masterly survey or intimate study through accurate application of some phase of the major subject.

Candidates for membership in the graduate school who do not desire to work for a degree may, with the approval of the director of the school, take more than one subject in the same department, or pursue work in several departments, if their preparation will permit. A statement of the subjects chosen must in each case be submitted to the director of the graduate school for approval by the student's advisory committee. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is essential to successful graduate work, and students not having this will find it necessary to acquire it as soon as possible after entering.

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of residence instruction. Such supervision will be exercised and credit granted as are essential to the highest standards of efficiency.

THESES.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject; must show that its writer possesses the ability to carry on original research; and must be an actual contribution to knowledge.

Two copies of each thesis in its final form, ready for the printer, must be submitted to the director of the school before the candidate for the degree may take the required oral examination. One of the said copies, to contain all drawings, is to be retained as an official copy by the said director, and the other by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis. When printed, three copies of each thesis must be deposited with the director of the graduate school and three copies with the department in which the work was carried out.

FINAL EXAMINATIONS.

For the degree of master of science or master of agriculture, a final examination, which may be either written or oral, or both, is given upon the completion of each subject.

For the degrees of doctor of philosophy or doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the faculty of the school.

DEGREES CONFERRED.

The degree of master of science and master of agriculture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least one year and a half¹ to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence.

2. The devotion of twenty hours¹ each week to the chief or major subject, and of from twelve to sixteen hours per week to the minor subject.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary. The thesis may be waived for the degree of master of agriculture.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least three years to the prosecution of three subjects of study and research in residence at the college.

¹ All time statements refer to minimum time.

2. The devotion of twenty hours¹ each week to the chief or major subject during the entire period, and of from twelve to sixteen hours per week for a year and a half to each minor subject.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science or master of agriculture is \$10, and for the degree of doctor of philosophy or doctor of agriculture, \$25.

COURSES OFFERED.

Courses available as major subjects for the degree of doctor of philosophy: —

Botany.	Horticulture.
Chemistry.	Microbiology.
Entomology.	

Courses available as major subjects for the degree of master of science: —

Agriculture.	Horticulture.
Agricultural economics.	Landscape gardening.
Agricultural education.	Mathematics and physics.
Agronomy.	Microbiology.
Animal husbandry.	Poultry science.
Botany.	Rural sociology.
Chemistry.	Veterinary science.
Entomology.	

Courses available as major subjects for the degree of master of agriculture: —

Agronomy.	Animal husbandry.	Poultry science.
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Courses available as minor subjects for the degree of doctor of philosophy: —

Agriculture.	Entomology.
Agricultural economics.	Horticulture.
Agricultural education.	Landscape gardening.
Agronomy.	Microbiology.
Animal husbandry.	Poultry science.
Animal pathology.	Rural sociology.
Botany.	Zoölogy.
Chemistry.	

Courses available as minor subjects for the degree of master of science: —

Agriculture.	Horticulture.
Agricultural economics.	Landscape gardening.
Agricultural education.	Microbiology.
Agronomy.	Mathematics and physics.
Animal husbandry.	Poultry science.
Animal pathology.	Rural sociology.
Botany.	Veterinary science.
Chemistry.	Zoölogy.
Entomology.	

¹ All time statements refer to minimum time.

GENERAL OUTLINE OF COURSES FOR ADVANCED DEGREES.

AGRICULTURAL ECONOMICS (Major Course). — 1. Graduate research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting and general field investigation. In all instances the method includes facility in investigation, tabulation and interpretation of results.

2. Candidates for the master's degree, or candidates offering a minor in agricultural economics, will be required to pass an examination covering the undergraduate work now offered in agricultural economics, including Course 3, the elements of economics, Course 7, the agricultural market and Course 6, co-operation in agriculture; and in addition such definite research work as may be outlined by the department, to consist of original investigations in some particular divisions of the subject of agricultural economics. Courses 6, 7 and 8 are for graduates and undergraduates. Special investigations may be made by electing seminars in agricultural economics.

3. Candidates for the master's degree will be required to write a thesis or a report covering results of a specific line of personal investigation in one or more fields of the subject. Each candidate will also be required to have a working knowledge of the general field of economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, statistics of agriculture and prices, and markets and marketing.

AGRICULTURAL EDUCATION (Major Course). — Courses are available in agricultural education as major or minor subjects for the degree of master of science, or, as a minor subject, for the degree of doctor of philosophy. Study will be pursued along one or several of the following lines: —

1. Massachusetts school legislation.
2. Origin and growth of primary, secondary and higher education in Massachusetts.
3. The origin and growth of normal schools, industrial schools and agricultural schools.
4. Educational literature, fiction, periodicals and reports.
5. The physical and mental development of the individual.
6. School administration.

AGRONOMY (Master of Science). — This course is developed in two directions, depending on whether the candidate is preparing for scientific work or for teaching. In the former case more attention is paid to methods of investigation; in the latter, to interpretation of results. The student may specialize in either Part I. or Part II. of the following: —

I. *Soil Fertility*. — (a) The humus problem: Effect of different cropping systems on the humous content of the soil; cultivation, drainage and liming in their effect on soil humus; increase by green manure crops; use of animal manures as sources of humus; conservation of organic matter.

(b) The nitrogen question: Losses of nitrogen as occasioned by cropping system, tillage methods and soil treatment; gain of nitrogen through legumes and other agencies; commercial nitrogen, physiological effect upon the plant, comparison of different forms both in regard to their ultimate as well as immediate effect, amount of application from the business standpoint.

(c) Mineral elements of plant food: as above for nitrogen.

(d) Lime: Causes of "soil acidity;" comparison of forms of lime; ultimate effect of lime on soil fertility; cost *versus* returns from use of lime.

(e) Crop adaptability.

II. *Field Crops*. — (a) Distribution, as governed by soil fertility; climatic influences; economic conditions.

(b) Kinds and varieties.

(c) Cultural methods.

(d) Breeding: A knowledge of the principles of breeding is presupposed. With this as a basis, a study of methods, practices and results, as applied to a given crop, must be made.

III. *Thesis*. — The thesis may be taken either in soil fertility or in crop production. In either case a problem for original investigation must be formulated by the candidate, the line of attack developed, the work carried through and results presented in acceptable form.

Literature. — It is required that the candidate familiarize himself with the available literature of the various topics studied.

ANIMAL HUSBANDRY (Master of Science). — *Course A. Animal Breeding*. — 1. Reading: Thorough survey of the scientific works dealing with plant and animal breeding and improvement.

2. Project: Each student must outline and pursue some Mendelian problem.

3. Thesis: This to be a complete treatise of the problem which the student undertakes; it should be a valuable contribution to the present knowledge of the question of animal breeding.

Course B. Animal Nutrition. — This course is in outline similar to A. It is designed to cover the field of nutrition, feeding and management of live stock.

Seminar: Regular periods will be devoted to a discussion of the projects undertaken, together with criticisms of the available material on the question pursued.

Object. — To give the student a comprehensive knowledge of feeding, breeding and management of live stock. This may be divided into a major and a minor, in order to give the student the opportunity of devoting a proportionate share of his time to the class of live stock in which he is particularly interested.

Reading. — The student is to make a very complete survey of experimental and periodical literature dealing with the various phases of the subject.

Practice. — Before the completion of the work for the degree, the student must have the equivalent of at least one year's continuous work on an approved live-stock farm.

Seminar. — Regular periods to discuss progress of the work.

ANIMAL PATHOLOGY (Minor Course only). — 1. Reviews in anatomy.

2. Reviews in organography and histology.

3. Special lectures and readings in general and special pathology.

4. Laboratory studies in general and special pathology.

5. Pathological technique.

6. Conferences.

BOTANY (Major Course). — Advanced work in botany may be taken in the following branches: —

(a) Plant physiology and ecology.

(b) Mycology.

(c) Plant pathology.

(d) Histology.

(e) Cytology.

(f) History of botany.

Particular attention is given to plant physiology and plant pathology, and students usually select for research a problem bearing on some phase of these branches of botany. It is aimed, however, to give each student a broad training in the science, and the attention which each one is required to give to other branches is determined by his previous training. Extensive reading of botanical literature is required. Lectures are given and weekly seminars are held at which important current botanical papers are reviewed and discussed.

CHEMISTRY. — I. Major course for the degree of master of science. Students will be required to take Courses 21, 28, 29, 30 and 31. In addition to this the requirements in the various thesis subjects are: —

Organic and Bio-Chemistry. — Courses 32 and either 25, 26 or 27, and 4 hours for one semester selected from Courses 23 (b) and (f), and 24.

Analytical and Agricultural Industrial Chemistry. — Courses 33, 23 (4 hours), and 4 hours for one semester selected from Courses 22, 24, 25, 26 and 27.

Physical Chemistry. — Courses 34, 24 and 4 hours for one semester selected from Courses 22, 23, 25, 26 and 27.

The candidate must pass a final written and oral examination before the Department of Chemistry upon undergraduate Courses 1 to 11, inclusive, 13 and 15, and upon all graduate work taken in chemistry by him.

II. Major course for the degree of doctor of philosophy. Students will be required to take Courses 21 to 31, and one course selected from 32, 33, 34 or 35. In addition, the student may be required to spend at least one semester at some other recognized institution pursuing graduate work in chemistry. The candidate must pass a final written examination before the Department of Chemistry, and an oral examination before the graduate staff, upon the whole field of chemistry, and must be especially well prepared in the lines of work covered by his research.

III. Minor course for the degrees of master of science and doctor of philosophy. Students will be required to take work totaling 36 to 48 hours. This may be selected from any of the undergraduate Courses 5, 6, 9 to 15, inclusive, or any of the graduate courses for which the student is prepared. In addition, the candidate must pass a final written and oral examination before the Department of Chemistry upon the courses taken and upon undergraduate Courses 5, 6, 9, 10 and 15.

The following is a list of the courses: —

21. *Inorganic Preparations.* — Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Ten to fifteen of the preparations given in Biltz's "Laboratory Methods of Inorganic Preparations" will be made by each student. First semester, 4 hours. Associate Professor ANDERSON.

22. *Advanced Inorganic Preparations.* — Laboratory. Continuation of Course 21. Either semester, 4 hours. Associate Professor ANDERSON.

23. *Advanced Analytical Chemistry.* — Laboratory. This course may be taken in part as follows: (a) electrolytic analysis, 4 hours per week; (b)

ultimate analysis, 4 hours per week; (c) special analytical work to meet the needs of the individual student, 4 hours per week. In addition, parts of undergraduate Courses 10 and 11 may be taken as follows: (d) fertilizers, 4 hours per week; (e) insecticides, 4 hours per week; (f) milk and butter, 4 hours per week. Either semester. Credit determined by amount of work done.

Professor WELLINGTON and Associate Professor PETERS.

24. *Advanced Physical Chemistry*. — Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent. hydrolysis of aniline hydrochloride from conductivity measurements; solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; critical temperature of carbon dioxide or sulphur dioxide; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; adsorption of iodine by charcoal; splitting of racemic glycerinic or racemic tartaric acids into their optical components. To each student separate work will be assigned. Either semester, 4 hours.

Associate Professor ANDERSON.

25. *Advanced Organic Preparations*. — Laboratory. The preparation of compounds not included in Courses 5 and 6, such as the Kolbe synthesis of salicylic acid; benzophenone and Beckmann's rearrangement; rosaniline, malachite green, congo red, indigo and other dyes; synthesis of fructose; Grignard reaction. Barnett, Cain and Thorpe, Gatterman, Noyes, Fischer and other laboratory guides are used. To each student separate work will be assigned. Either semester, 4 hours.

Professor CHAMBERLAIN.

26. *Advanced Bio-Chemistry*. — Laboratory. The hydrolysis of proteins and isolation of the amino acids; the study of milk, blood and urine; dietary and digestion studies. References: Abderhalden, Plimmer, Salkowski, Hawk, etc. To each student separate work will be assigned. Either semester, 4 hours.

Professor CHAMBERLAIN.

27. *Industrial Organic Chemistry*. — Laboratory. The preparation, on a large scale, of wood alcohol, acetic acid, ethyl alcohol, benzene and cellulose products, such as mercerized cotton and artificial silk. References: Molinari, Rodgers and Aubert, Thorpe, *Enzyklopädie der tech. Chemie*, etc. To each student separate work will be assigned. Either semester, 4 hours.

Professor CHAMBERLAIN.

28. *Advanced Theoretical and Analytical Chemistry*. — Lectures. The following are among the topics considered: compressibility of the atoms; atomic structure; valence electrons; and detailed studies of substances important in analytical chemistry, such as barium sulfate, silver chloride, magnesium pyrophosphate. Second semester, 1 hour.

Associate Professor PETERS.

29. *Advanced Organic and Bio-Chemistry*. — Lectures. Selections from the following topics: the constitution, chemical relationship, physiological function and industrial uses of fats, cholesterol, phytosterol, lecithin, carbohydrates, proteins, amino acids, urea, uric acid, purine bases, alkaloids, terpenes, tannin,

essential oils, synthetic dyes, rubber; the study of enzymes, fermentation, animal food and nutrition, photosynthesis; isomerism, tautomerism, condensation. References: Monographs on Bio-Chemistry, Chemical Monographs, Abderhalden, Plimmer, Haas and Hill, Lewkowitsch, Cohen, Fischer, Euler, Czapek, Cain and Thorpe. First semester, 1 hour.

Professor CHAMBERLAIN.

30. *Advanced Theoretical and Physical Chemistry*. — Lectures. The relation between the constitution and properties of compounds; mutarotation; steric hindrance; stereoisomerism of other elements than carbon; molecular association; similarity between compounds of silicon and carbon; radioactivity. Second semester, 1 hour.

Associate Professor ANDERSON.

31. *Seminar*. — Conferences, reports or lectures. Both semesters, twice a month, 1 hour.

Professor LINDSEY.

32. *Research in Organic and Bio-Chemistry*. — Both semesters. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Professor CHAMBERLAIN.

33. *Research in Analytical or Agricultural Industrial Chemistry*. — Both semesters. A minimum of 20 hours' laboratory work per week. Credit determined by the amount of work done.

Professor WELLINGTON and Associate Professor PETERS.

34. *Research in Physical Chemistry*. — Both semesters. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Associate Professor ANDERSON.

35. *Research in Agricultural Chemistry*. — Both semesters. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Professor LINDSEY and EXPERIMENT STATION ASSOCIATES.

ENTOMOLOGY (Major Course).—I. For the degree of doctor of philosophy as a major: Some knowledge of all the divisions of this subject is essential for the professional entomologist, though a large part of his time will be devoted only to certain portions. To insure some familiarity with all these divisions, lectures, laboratory work, field training or required reading are given in each of the following topics:—

(a) *Morphology*. — Embryology and polyembryony; transformations; histology; phylogeny; hermaphroditism; hybrids; parthenogenesis; pedogenesis; heterogamy; chemistry of colors; coloration; luminosity; deformities; variation.

(b) *Ecology*. — Dimorphism; polymorphism; protective devices; mimicry; psychoses; insect architecture; plant fertilization; insect products; geographical distribution; methods of distribution; migration; geological history; insects and disease; enemies of insects, vegetable and animal; duration of life; experimental entomology.

(c) *Economic Entomology*. — Special methods of control; insecticides; special research; insect photography; methods of preparing illustrations;

field work and life-history investigations; insect legislation; methods of record keeping.

(d) *Systematic Entomology*. — History of entomology; classifications and the principles of classification; nomenclature and its rules; how to find and use literature; preparing indices; number of insects known and in existence; lives of prominent entomologists; methods of collecting, preparing, preserving and shipping; important collections; location of types.

(e) *Seminar*. — A monthly meeting of graduates, at which reports on current literature are presented and various entomological topics of importance are discussed.

(f) *Required Readings*. — The best articles on topics named above and on the different orders of insects, in English, French or German, the candidate to be examined at the close of his course on this with his other work.

(g) *Thesis*. — A thesis, illustrated with drawings, consisting of the results of original investigation upon one or several topics, and constituting a distinct contribution to knowledge, must be completed before the final examinations are taken.

II. For the degree of doctor of philosophy as a minor, and for the degree of master of science either as a major or minor: Such portions of the course outlined above as seem most appropriate to their other subjects are given to students taking entomology as a minor.

HORTICULTURE. — Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which now constitute the college Division of Horticulture, as follows: pomology, floriculture, landscape gardening, forestry and market gardening. For work in these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This general work is under the direction of Prof. F. A. Waugh, head of the Division of Horticulture.

LANDSCAPE GARDENING (Major Course). — Every student before receiving his master's degree with a major in landscape gardening must have given some thorough and fruitful study to each of the following five departments. As far as possible these studies must be of a practical nature, *i.e.*, they must be made upon actual projects in progress of development.

1. *Theory*. — The principles of esthetics as applied to landscape gardening.
2. *Design*. — The principles of pure design and their application in landscape and garden planning.
3. *Construction*. — The practical methods of carrying out landscape plans, laying out, equipment, organization of working force, time and cost keeping, etc.
4. *Maintenance*. — Methods, organization, cost.
5. *Practice*. — Office work, drafting, estimating, reporting, charges, accounting.

Qualifications. — Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape gardening, either in design, construction or management.

Thesis or Project. — Each student, before receiving the master's degree with a major in landscape gardening, must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape gardening, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of: —

- (a) Original surveys, including topography.
- (b) Block plans, showing original design.
- (c) A rendered plan or plans of the main features.
- (d) Detailed working drawings.
- (e) Estimates of cost.
- (f) Complete report and letter of transmittal.

Minor Course. — Any student electing a minor in landscape gardening will be directed to take such courses from the regular catalogue list as may seem most suitable for him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where, by so doing, it is possible to give the student material assistance in the plan of his major work.

MICROBIOLOGY (Major Course). — 1. *Reading.* — Readings will be assigned and reports with critical analyses of literature covering the general subject will be required. For this purpose such material will be selected as will be most pertinent to the needs of the student. Lectures will be given from time to time.

2. *Seminar.* — At intervals the immediate laboratory work and studies of the student will be surveyed and the literature bearing thereon will be discussed. The shaping of investigations in accordance with the critical analyses of the specific literature of the problem involved will be the important rôle of the seminar.

3. *Morphological and Cultural Studies.* — Special advanced studies in the cytology, morphology and cultural characters of micro-organisms will be the general theme of this course. The important factors in classifying and grouping organisms call for an intimate knowledge of this particular phase of microbiology. Laboratory technic will receive emphasis.

4. *Physiological Studies.* — The changes produced by micro-organisms and their functionings in general open a very broad field for investigation and systematic study. It is advised that every graduate student in microbiology give much attention to this branch, gaining thereby the greatest comprehensive knowledge of physiological processes, as well as the methods employed in their determinations.

5. Special advanced courses will be offered in those phases of microbiology indicated by the undergraduate courses: —

1. Fermentation microbiology.
2. Soil microbiology.
3. Dairy microbiology.
4. Food microbiology.
5. Hygienic and sanitary microbiology.

It will be assumed that all graduate students of microbiology must be acquainted with the details of all important phases of agricultural microbiology.

Minor Course. — 1. Courses constituting undergraduate major in microbiology, or their equivalent, will be required.

NOTE. — If the student is familiar with the work of these courses, advanced work will be given in accordance with the graduate major outline.

2. Emphasis will be placed upon that particular phase of microbiology which will be particularly pertinent to the student's major course.

3. Readings will be assigned, and will be reviewed in conferences.

4. Special lectures on selected subjects in microbiology will be given from time to time.

POULTRY SCIENCE (Major Course for the Degrees of M.S. and M.Agr.). —

1. *Reading.* — This course consists of a review of the entire field of poultry literature, covering books, bulletins and special articles. A written report on one or more subjects will be required.

2. *Seminar.* — This course consists of a criticism of the most important experiments carried on at the various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc., besides a detailed study of some of the largest poultry projects in this country.

3. *Anatomy (Gross and Histological), Physiology, Embryology and Surgery.* — This course consists of a careful study of the anatomy and physiology of the fowl; also the development of the chick in the shell, not only as an embryological study, but in relation to morphogenesis and heredity. Instruction in surgical technique, adapted to fowls, forms part of the work.

4. *Breeding.* — The student will carry on such breeding experiments as time and facilities permit. He may also do work in connection with our regular experimental projects. A detailed study of the pertinent literature will be required. Animal Husbandry 5, or its equivalent, is a prerequisite.

5. *Feeding.* — A study of the relation of various foods and other substances to the morphology and physiology of the bird, with special reference to such subjects as egg production, feather form and structure, condition of flesh, bone, etc.

6. *Brooding.* — Studies will be made upon the relation between viability and rate of growth and the following topics: type of brooder, number of chicks in brood, ventilation, humidity, sanitation, exercise and weather conditions; also a comparison of hen-hatched chicks with those hatched artificially.

7. *Incubation.* — This course includes a study of a large number of perplexing problems of a practical, scientific and mechanical nature.

8. *Poultry Diseases.* — This course includes a study of a number of the most important poultry diseases in relation to the rapidity with which they spread and their eradication; also various problems in poultry sanitation.

9. *Thesis.* — This may be either of a scientific or practical nature, or both, and subjects may be chosen from any one of the above courses, except the first and second. (Required of students working for degree of M.S.)

NOTE 1. The postgraduate course presupposes all undergraduate work or its equivalent, together with practical experience. Without the latter, students will be unable to handle Courses 4, 5 and 6. At the discretion of the instructor in charge, graduate students may be required to pursue undergraduate courses in other departments without credit.

NOTE 2. Practical poultry work may be required, but no credit will be given for such work.

NOTE 3. Courses 1 and 2 are designed particularly for minors.

RURAL SOCIOLOGY. — *General Sociology.* — Candidates for the doctorate must have a good working knowledge of general sociology.

1. History and development of sociological thought.
2. The literature of sociology.
3. Problems of modern sociology and methods of reform.

Rural Sociology. — Candidates will be required to pass an examination in all courses offered by this department primarily for undergraduates, as shown in the departmental classification.

Research Work in Rural Sociology. — Each candidate will be required to select two or more of the divisions of the subject for intensive study and research.

1. The rural community: —
 - (a) Historical development.
 - (b) Influence of modern conditions on family and community life.
 - (c) Problems and methods in community organization.
 - (d) Community planning in Massachusetts.
2. Origin and development of rural institutions: —
 - (a) Scope, function and influence of educational institutions on rural social progress. Plans for betterment.
 - (b) History of the development of the rural church, its problems and program for improvement.
 - (c) The farm family, in its relation to religious, cultural, educational and social agencies. The relation of the standard of living to rural social progress.
3. Rural organization: —
 - (a) The scope and function of rural organization in development of rural life.
 - (b) Work of the national government in rural organization.
 - (c) County and institutional work in rural organization.
 - (d) Leadership in its relation to organization.
4. Rural government and rural law: —
 - (a) Development of rural local government in New England and the west. Progress in efficient local self-government.
 - (b) Relation of the State to the farmer, influence of the farmer in legislation, the organized ways and means by which the State aids the farmer directly.
 - (c) Work of the national government in its relation to the social welfare of the farming people.
 - (d) Agrarian legislation in the United States and Europe affecting rural social welfare.
5. Farmers' organizations: —
 - (a) Social problems underlying farmers' organizations in reference to service and permanency.
 - (b) Principles of organization.
 - (c) History of farmers' organizations in the United States.
6. Rural social and sociological surveys: —
 - (a) An intensive study of the place and function of statistical data in the sociological field, its evaluation and interpretation.
 - (b) A critical study of social surveys of rural life and methods of survey, with a view to discovering the strength and weakness of each.
7. Social condition of the rural people: —
 - (a) Origin and development of rural ideals.
 - (b) The status of the rural people in relation to health, morality, crime, etc.
 - (c) Problems of social psychology arising in rural life.

A thesis showing the results of personal investigation on some particular topic or topics must be presented. The thesis must show familiarity with the material bearing on the subject, ability in discovering and utilizing original sources, judgment in evaluating facts, evidences and authorities, originality and independence of thought. It must be a contribution in a very definite way to rural sociological thought.

Candidates for the master's degree, or candidates offering a minor in rural sociology, will be required to pass an examination in the following courses offered by the department for undergraduates: —

Course 2. Rural organization.

Course 5. Rural government.

Course 7. Social psychology of rural life.

In addition, they will be required to pursue a line of investigation through work in the seminar.

VETERINARY SCIENCE. — Work is available in anatomy, hygiene, veterinary pathology, medicine, surgery, parasitology and other special lines or divisions of the subject.

ZOOLOGY. — Courses in zoölogy may be available as a minor for the degree of master of science and as a minor for the degree of doctor of philosophy. The nature of the work will necessarily vary according to circumstances, and may be intensive in a special field, like that of embryology or economic ornithology, and be correlated closely with the major work of the student, or it may be of a more general character, depending on the student's needs or previous acquaintance with general zoölogical science. The time devoted to zoölogy as a minor for either of the above-named degrees may vary from 12 to 16 hours per week, pursued for a year and a half.

LIST OF STUDENTS.

A list of the degrees conferred in the Graduate School, and of the students enrolled, is given in the general lists at the end of the volume.

THE SHORT COURSES
AND
THE EXTENSION SERVICE.

THE SHORT COURSES AND THE EXTENSION SERVICE.

SHORT COURSES.

The short courses offered by the Massachusetts Agricultural College are designed to meet the needs of those who cannot come to the college for the regular academic courses. They furnish the student with instruction in modern accepted methods, and are made as concentrated and as practical as possible. In the main, the instruction is given by the regular teaching force of the college, the same laboratories and equipment being used as in the regular college work.

The short courses may be grouped as follows: —

- A. Winter Schools.
 - 1. Ten Weeks' Course.
 - 2. Farmers' Week.
 - 3. Annual Beekeepers' Convention.
 - 4. Polish Farmers' Day.
 - 5. Spring Beekeeping School.
 - 6. Apple Packing School.
 - 7. Annual Conference of County Agents and Vocational Agricultural Instructors.
- B. Summer Schools.
 - 1. Summer School of Agriculture and Country Life.
 - 2. School for Rural Social Service.
 - 3. School for Library Workers.
 - 4. Poultry Convention.
 - 5. Agricultural Camps.
 - 6. Conference on Rural Organization.
- C. Miscellaneous Short Courses.
 - 1. Short Courses for Special Groups (feed dealers, town officials, etc.).
 - 2. Special Days for Foreigners.
 - 3. Meetings of Organizations at the College.

EXPENSES OF THE SHORT COURSES. — The expense of attending any of the short courses is approximately as follows: —

Registration fee (Ten Weeks' Course, Apple Packing School, Summer School),	\$5
Furnished rooms in private houses (per week),	\$1.50-\$3
Board at college dining hall (per week),	\$4-\$4.25
Board with private families (per week),	\$5-\$6

A lunch counter is operated in connection with the college dining hall. Meals may be obtained there *à la carte* at very reasonable rates.

Students in each of the dairy courses must provide themselves with two white wash suits and caps for use in the practical dairy work. The cost in Amherst is about \$1.25 for suit and cap.

REQUIREMENTS FOR ADMISSION TO SHORT COURSES. — No entrance examinations are required, but students are advised to review their school work in English and arithmetic. Practical experience in farm, garden, orchard or greenhouse work is an advantage. The courses are open to both men and women.

Students must be at least eighteen years of age, and must furnish satisfactory evidence of good moral character. References are required, and these are investigated before applicants are accepted.

A. WINTER SCHOOLS, 1916.

1. OUTLINE OF THE TEN WEEKS' COURSES (JANUARY 3 TO MARCH 10, INCLUSIVE). — The following courses are offered: —

1. Soil Fertility. Professor HASKELL. Three lectures a week.
2. Field Crops. Assistant Professor JONES. Two lectures and one two-hour laboratory period a week.
3. Types and Breeds of Live Stock. Professor McNUTT. Three lectures and two two-hour judging periods a week.
4. Live Stock Feeding. Assistant Professor QUAIFF. Three lectures a week.
5. Animal Breeding. Professor McNUTT. One lecture and one two-hour laboratory period a week.
6. Dairying. Professors LOCKWOOD and JAMISON, Mr. COONS and Mr. BALDINGER. Five lectures and one one-hour, two two-hour and two three-hour laboratory periods a week.
7. Dairy Bacteriology. Professor MARSHALL. Two lectures a week.
8. Animal Diseases and Stable Sanitation. Professor PAIGE. Two lectures a week.
9. Poultry Husbandry. Professor GRAHAM and Mr. PAYNE. Five lectures and one two-hour laboratory period a week.
10. Farm Management and Farm Accounts. Professor FOORD. One lecture and one two-hour laboratory period a week.
11. Fruit Growing. Professor SEARS. Three lectures and one two-hour laboratory period a week.
12. Market Gardening. Assistant Professor A. S. THOMSON. Three lectures and two two-hour laboratory periods a week.
13. Landscape Gardening. Assistant Professor HARRISON. Two two-hour periods a week.
14. Floriculture. Associate Professor NEHLING and Mr. THURSTON. Three lectures a week; field trips on Saturday.
15. Forestry. Professor CLARK. One lecture a week.
16. Botany. Assistant Professor ANDERSON. Two lectures a week.
17. Entomology. Dr. W. S. REGAN. Three lectures a week.
18. Beekeeping. Associate Professor GATES and Mr. BYARD. Two lectures and one two-hour laboratory period a week.
19. Farm Mechanics. Professor GUNNESS. One lecture and one two-hour laboratory period a week.
20. Rural Sanitary Science. Professor MARSHALL. Two lectures a week.
21. Rural Improvement. Professor WAUGH. Two lectures a week.
22. Problems of Marketing and Distribution. Professor CANCE. Two lectures a week.

2. FARMERS' WEEK. — In order to reach those who cannot come to the college for a longer time this very practical course, five days in length, is given each year. The regular college equipment is used, and work of the regular faculty is supplemented by lectures and demonstrations by eminent men and women.

The 1916 program will probably be divided into seven sections, as follows: —

1. Field Crops and Farm Management.
2. Animal Husbandry and Dairying.
3. Poultry Husbandry.
4. Fruit Growing, Market Gardening, Floriculture, Forestry.
5. Women's Section, Home Economics.
6. Business Organization and Marketing.
7. Beekeeping.

These sections take up the time from early morning until late afternoon. Prominent men are engaged for the evening lectures. Fruit, corn, live stock,

dairy and poultry shows, and other exhibits, are among the leading features. No fee is charged.

Owing to the prevalence of foot and mouth disease in 1915 the best program yet prepared was necessarily abandoned. Special efforts will be made in the preparation for the biggest Farmers' Week yet held, from March 13 to 17, inclusive, 1916.

3. ANNUAL BEEKEEPERS' CONVENTION. — This convention of beekeepers is held during Farmers' Week. Illustrated lectures, practical demonstrations and commercial displays are features of the convention. Meetings of State and county beekeepers' associations and of apiary inspectors also are scheduled at this time.

4. POLISH FARMERS' DAY. — A special day is each year set aside which is known as "Polish Farmers' Day." Instruction is given relative to the crops and animals in which the Polish people are most interested, soil fertility problems, co-operation, American citizenship, history, etc. Hundreds of Polish farmers reside in the Connecticut valley, and large numbers avail themselves of this opportunity which is peculiarly their own. It will be held on March 23, 1916.

5. SPRING BEEKEEPING SCHOOL. — This school is held in Amherst once in three years, being conducted in other sections of the State in intervening years. It is an intensive course for a limited number of beekeepers. It occupies seven hours daily for a period of two weeks. Courses are given in practical beekeeping; life of the honeybee; special problems of the beekeeper; crops foraged by bees; relation of bees to pollination of plants; bees in horticultural practice. The instructors are Professors Gates, Fernald, Paige, Brooks, Osmun, and Chenoweth and Mr. Byard. The course will be given May 31 to June 14, 1916.

6. APPLE PACKING SCHOOL. — The work of this school, which is conducted by the Department of Pomology, is of a practical nature, and includes both box and barrel packing. Persons taking the course will become familiar with the various types of packs, and will receive sufficient practice to enable them to do good commercial packing. The 1916 school will probably be held November 15 to 21, inclusive.

7. ANNUAL CONFERENCE OF COUNTY AGENTS AND VOCATIONAL AGRICULTURAL INSTRUCTORS. — In December of each year a one-week conference of county agents and vocational agricultural instructors is held at the college. This is for the purpose of correlating the extension work throughout the State, and to enable the field workers to keep in up-to-the-minute touch with agricultural problems, methods and research as conducted in Massachusetts as well as other States in this particular section of the country. The fourth annual conference will probably be held during the second full week in December, 1916.

B. SUMMER SCHOOLS.

1. THE SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE. — The Summer School of the Massachusetts Agricultural College will open June 26, 1916, for a term of four weeks. The work of the summer school was designed originally for teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture, and who can come to the

college conveniently during the summer season. Practical courses are offered for the benefit of such persons.

The formal instruction in the summer school is given in definite courses. Each student may elect not less than 10 nor more than 15 exercises a week, unless a larger or smaller amount of work is allowed by the supervisor. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

General field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Excursions are arranged for every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. These excursions are in charge of an instructor. In the past they have proved a very enjoyable feature of the work. Round-table and special discussions are arranged by the various instructors as their courses require.

A course of evening lectures on popular topics relating to the work of the school is a feature of the general program. This lecture course is free to all students.

Early registration is desirable. Registration fee for the summer school is \$5, payable at the time application is made. No other tuition is charged. This fee should accompany application blank and should be made payable to the Massachusetts Agricultural College.

2. THE SCHOOL FOR RURAL SOCIAL SERVICE. — The Massachusetts Agricultural College offers a School for Rural Social Service in connection with the usual Summer School of Agriculture and Country Life. The courses offered give instruction, furnish information and direct the attention of those interested more particularly to the rural field, which has as yet received little systematic study when compared with that which has been given to urban conditions.

The courses offered are intended for clergymen, teachers, librarians, town officers, grange workers and others who devote a considerable portion of their time to problems of community development. Other courses given in the summer school during this period are also open to those who register. There is a registration fee of \$1 for those attending this school. The dates for 1916 are July 11 to 25.

3. SCHOOL FOR LIBRARY WORKERS. — During the summer of 1915 a very successful School for Library Workers, of one week's duration, was held at the college. The work was planned especially for those librarians and library assistants in village and rural libraries whose special training and experience had necessarily been limited. This school will again be offered in 1916 from July 17 to 22.

4. POULTRY CONVENTION. — In order to give a large number of poultrymen, who cannot come to the college for a long period of time, practical instruction in modern methods of breeding, feeding, poultry-house construction, operation of incubators and brooders, selecting and judging poultry for utility and for show, and in marketing poultry products, an annual three-day convention is offered. This will be held from July 19 to 21, 1916, inclusive.

5. AGRICULTURAL CAMPS. — During the month of July three camps are arranged in order that boys from rural districts and small towns may receive some instruction in agriculture and clean, wholesome sports, and that they may have impressed upon them their responsibilities as coming members of society. The daily program consists of camp duty, flag raising, agricultural lessons, talks on hygiene and good citizenship, play and recreation, instruction in

handicrafts, photography, evening camp fires and lectures by men prominent in boys' work. A small fee is charged to help defray the cost of board and incidental expenses. As a third prize in the State-wide boys' and girls' clubs a week in camp at the college is offered. The third boys' camp is given over to these prize winners, usually 35 to 40 in number. A separate camp, upon a slightly different plan and under different supervision, is held for the girl prize winners of the previous year.

6. CONFERENCE ON RURAL ORGANIZATION. — This conference is held as a closing feature of the summer school each year. It takes up various problems of New England country life. Numerous State organizations co-operate with the college in providing the programs. Section meetings of various groups are held each forenoon, a general round-table discussion is held each afternoon, and lectures are delivered each evening by persons prominent in social and educational work. Many small group conferences are also arranged.

The holding of this conference in 1916 is now under advisement, and it may be omitted owing to the fact that the Graduate School of Agriculture is to be held at the Massachusetts Agricultural College in 1916. If held, the dates of the conference will probably be July 25 to 28, inclusive.

The faculty of the 1915 summer schools was as follows: —

KENYON L. BUTTERFIELD, LL.D., President of the College and Head of the Division of Rural Social Science.

WILLIAM D. HURD, M.Agr., Director of the Extension Service and Supervisor of Short Courses.

WARREN S. BAKER, B.Sc., Instructor in Agronomy.

JOHN L. BYARD, Superintendent of Apiary.

ADA M. CHANDLER, B.A., Library Cataloguer.

WALTER W. CHENOWETH, Associate Professor of Pomology.

WILLIAM D. CLARK, A.B., M.F., Professor of Forestry.

LAURA COMSTOCK, Extension Professor of Home Economics.

SAMUEL COONS, Instructor in Dairying.

PHILIP H. ELWOOD,¹ Jr., B.Sc.Agr., Extension Instructor in Civic Improvement.

Rev. WM. F. ENGLISH, Ph.D., Pastor, East Windsor, Conn.

R. HAY FERGUSON,² B.Sc.Agr., Extension Professor of Agricultural Economics.

HENRY T. FERNALD, Ph.D., Professor of Entomology and Chairman of the Division of Science.

JAMES A. FOORD, M.Sc.Agr., Professor of Farm Administration and Head of the Division of Agriculture.

BURTON N. GATES, Ph.D., Associate Professor of Beekeeping.

HAROLD M. GORE, B.Sc., Assistant in Physical Education.

JOHN C. GRAHAM, B.Sc., Professor of Poultry Husbandry.

CHARLES R. GREEN, B.Agr., Librarian of the College.

F. JOSEPHINE HALL, A.M., Adviser for Women.

IDA E. HALL, LL.B., Plays and Pageants.

HARRIET J. HOPKINS,¹ B.Sc., Extension Instructor in Home Economics.

WILLIAM P. B. LOCKWOOD, M.Sc., Professor of Dairying.

A. H. MACLENNAN, Lecturer in Horticulture, MacDonald College, Quebec.

CHARLES J. MAYNARD, Naturalist and Lecturer on Bird Life.

FREDERICK A. McLAUGHLIN, B.Sc., Instructor in Botany.

EZRA L. MORGAN, A.M., Extension Professor of Community Planning.

ORION A. MORTON, Extension Professor of Agricultural Education.

ETHEL H. NASH, Extension Instructor in Agricultural Education.

ARNO H. NEHRING, Associate Professor of Floriculture.

A. VINCENT OSMUN, M.Sc., Associate Professor of Botany.

SAMUEL R. PARSONS, B.Sc., Instructor, Pennsylvania State College.

CHARLES A. PETERS, Ph.D., Associate Professor of Inorganic and Soil Chemistry.

ELVIN L. QUAIFFE, B.Sc.Agr., Assistant Professor of Animal Husbandry.

FREDERICK W. RIED, Director of Practical Arts, Framingham (Mass.) Normal School.

¹ Resigned.

² Deceased.

HENRY K. ROWE, Ph.D., Newton (Mass.) Theological Seminary.

WALTER RUETSCHI, Assistant Director of Athletics, New Jersey Public Schools.

FRED C. SEARS, M.Sc., Professor of Pomology.

FRANK A. WAUGH, M.Sc., Professor of Landscape Gardening and Head of Division of Horticulture.

A bulletin describing the summer schools is issued in March each year, and may be had upon application to the Supervisor of Short Courses.

C. GRADUATE SCHOOL OF AGRICULTURE.

A Graduate School of Agriculture to be held at the college from July 3 to 28, 1916. Every possible effort will be made to correlate the work of the various summer schools with the work of the graduate school, in order that students in each may benefit to the largest possible degree by the opportunities presented by the other.

D. MISCELLANEOUS SHORT COURSES.

1. SHORT COURSES FOR SPECIAL GROUPS. — Plans are now under way to provide short courses at Amherst, lasting four or five days, for fertilizer agents, feed agents and dealers, milk inspectors, seed dealers and other groups desiring such instruction. Information concerning these may be obtained by writing the Supervisor of Short Courses.

2. SPECIAL DAYS FOR FOREIGNERS. — Each year there are provided at the college special days for foreigners. Instruction is given in soil management, co-operation, American citizenship and history. This work for foreigners will be arranged at the college, or in different sections of the State.

3. MEETINGS OF ORGANIZATIONS AT THE COLLEGE. — It is customary for the various State organizations of fruit growers, poultrymen, breeders and others to meet for conventions and picnics at the college. Such gatherings are welcomed by the college authorities, and organizations are cordially invited to meet in Amherst. The Extension Service will assist in arranging programs and other forms of instruction and entertainment.

All requests for announcements or further information regarding any of the short courses should be addressed to the Supervisor of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

THE EXTENSION SERVICE.

What is known as the Extension Service is an organized effort on the part of the college to carry systematic and dignified instruction to the thousands of people throughout the State who are unable, owing to various reasons, to take advantage of the regular courses offered at the college. It is in reality the "carrying of the college to the people of the State." Every department of the institution, in so far as the regular teaching and research work will permit, contributes what it can to this work. The work may be roughly classified under the following general heads: general administration; correspondence study; itinerant instruction which includes lectures and lecture courses, exhibits, demonstrations and extension schools; extension work through the various departments of the college, in which the extension specialist is responsible to the head of the department for the technique of the work and to the director of the extension service for the accomplishment of the work; co-operative

work of various kinds with the United States Department of Agriculture; and extension work through county, district and local agents. Some of the ways in which this is being done are described briefly below.

CORRESPONDENCE COURSES. — The purpose of the correspondence courses is to furnish systematic instruction in those lines which will most benefit the general farmer, the dairyman, the fruit grower, the market gardener, the poultryman, the teacher, the homemaker, and all others who are interested in agricultural and country-life matters. It is the purpose to present up-to-date, accurate and concise information in such a manner and in such language that all who pursue the study may readily understand the work.

Courses offered. — A number of courses are in process of revision and several are being rewritten. During 1916 courses will be available as follows: —

1. Soils and Soil Fertility. Professor HASKELL.
2. Manures, Fertilizers and Soil Amendments. Professor HASKELL.
3. Field Crops. Assistant Professor JONES.
4. Farm Dairying. Professor LOCKWOOD.
5. Fruit Growing. Professor SEARS, Associate Professor CHENOWETH and Mr. REES.
6. Market Gardening. Assistant Professor A. S. THOMSON.
7. Animal Feeding. Mr. TURNER.
9. Farm Accounts. Professor FOORD.
10. Entomology. Dr. REGAN.
12. Beekeeping. Associate Professor GATES.
13. Forestry. Professor CLARK.
14. Shade Tree Management. Associate Professor OSMUN.
17. Poultry Husbandry. Professor GRAHAM.
18. Home Economics. Extension Professor COMSTOCK.
19. Rural Sociology. Professor PHELAN and Mr. BAIRD.

Methods of conducting the Work. — The best known methods of conducting correspondence course teaching are employed. Certain courses are based entirely upon text-books, others consist wholly of typewritten lectures, while still others combine the two. Even when books are not required they are usually recommended for reference or collateral reading.

The courses are designed primarily for the individual student. A new phase of the work, however, is the organization of study clubs or classes, meeting together periodically and using the courses as a basis of study. Correspondence in regard to this work is invited.

Enrollment of Correspondence Courses. — Students may enroll in the courses at any time between October 1 and June 1, and one year from the date of registration is allowed for the completion of each course. It has been found advisable to discontinue the courses through the summer months, as farmers and most other students cannot devote the necessary amount of time to the lessons during this season.

Expenses of the Correspondence Courses. — In order that none shall enroll except those who are interested and desire to pursue earnest study, a small fee is charged. This has been fixed at \$1 for each course except where the courses are divided, and it has been found advisable to charge \$1 for each of the parts in these instances. The fee is payable strictly in advance, at the time the enrollment card is sent. When text-books are required the student purchases these.

LECTURES AND DEMONSTRATIONS. — The members of the faculty of the college are, when other duties will permit, available for lectures and demonstrations before granges, men's clubs, women's clubs, Y. M. C. A.'s, farmers' clubs,

boards of trade and other organizations. A list of more than 40 lecturers and 200 subjects on various phases of agriculture, country life, economics, sociology, education, civic betterment and various scientific subjects has been prepared. Full courses of lectures or single lectures may be arranged.

Organizations arranging the lectures are asked to pay the traveling expenses of the lecturer, provided no admission fee is charged. When admission is charged the lecturer is entitled to a fee in addition to traveling expenses.

EXTENSION SCHOOLS. — The extension schools are of two distinct types, the first being the Agricultural Extension School, dealing with the production side of farming and with the problems of the farm home; the second is the Extension School in Community Planning, having to do with the organization and selling end of agriculture, and with instruction in the planning and carrying forward of various community activities.

It is also possible to arrange special extension schools along one particular line of work, such as fruit growing, dairying, etc.

Communities desiring an extension school make a written request, agreeing to defray all local expenses, such as the rent, heating and lighting of a suitable hall, and the board of the instructors during the school.

Agricultural Extension Schools. — The college sends a corps of instructors to a town for a five-day school of instruction. At present the following courses are offered: soil fertility, animal husbandry and dairying, fruit growing, poultry husbandry and vegetable gardening for the men, and a homemakers' course for the women. Morning and afternoon sessions only are held.

Community Planning Extension Schools. — These schools are arranged to extend over at least three days. The following courses are offered: education, agricultural organization, community program, civic improvement, farm management, town administration, public health, community recreation and homemaking. Morning, afternoon and evening sessions are held in these schools.

EDUCATIONAL EXHIBITS AT FAIRS AND OTHER SHOWS. — The college co-operates with the managers of fairs, industrial expositions, corn shows, poultry shows, fruit shows and other exhibitions by making educational exhibits.

For outside work a large tent has been provided. In this about thirty cabinets containing educational material are arranged. A corps of lecturers and demonstrators accompany the exhibit and give practical instruction daily.

For inside work a space at least 40 by 60 feet is required for this exhibit. Smaller exhibits along special lines are sent to corn, fruit and poultry shows, milk shows, child welfare exhibits, and so forth.

The managers of fairs and exhibits are required to partially meet the cost of presenting these exhibits.

EXTENSION WORK IN SPECIAL FIELDS.

EXTENSION WORK IN FRUIT GROWING. — This work includes lectures and demonstrations on laying out and planting orchards, pruning, spraying, thinning, grading, packing and marketing fruits. Demonstration orchards, new and renovation plots, are established in different sections of the State, under a coöperative agreement between the college and the owners of land. Extension schools in fruit growing and fruit grading and packing are arranged on request. Visits to farms for advisory work are made, and correspondence on orcharding subjects are invited.

EXTENSION WORK IN ANIMAL HUSBANDRY. — This work includes lectures, demonstrations and advisory assistance on subjects pertaining to cattle, horses, sheep and swine, as well as instruction in barn planning. Assistance in organizing dairy improvement associations and breeders' associations is given; stock-judging contests for boys are arranged at the leading fairs.

EXTENSION WORK IN DAIRYING. — This includes lectures and demonstrations on the handling and care of milk, cream, butter and cheese; Babcock testing, dairy utensils and dairying manufactures. Educational campaigns may be arranged in different communities, seeking to educate producers, dealers and consumers as to the production and distribution of clean, safe milk.

EXTENSION WORK IN POULTRY HUSBANDRY. — In addition to conferences at the college and visits to the plants of poultrymen, advice on general poultry management, diseases, mating and laying out and planning buildings, this work includes co-operative work with other State and county agricultural and educational organizations, exhibits of poultry appliances at fairs and shows and other incidental phases.

EXTENSION WORK IN FARM MANAGEMENT, FIELD STUDIES AND DEMONSTRATIONS. — This is carried on coöperatively between the college and the office of farm management of the United States Department of Agriculture at Washington. It consists of a study of farm conditions and farm management problems; instruction in keeping farm accounts and growing field crops; the use of fertilizer and lime; advice as to farm equipment, buildings, and so forth.

EXTENSION WORK IN CIVIC IMPROVEMENT. — This is carried on in connection with the Department of Landscape Gardening at the college. Assistance is rendered in various rural and village improvement enterprises, such as the planting and care of shade and street trees, the planning of playgrounds, school grounds, cemeteries, picnic grounds, the beautifying of waterfronts, the rearrangement and development of town commons and reservations of historic interest, and similar activities. Efforts are made to coöperate with local granges, men's and women's clubs, village improvement societies and like organizations.

EXTENSION WORK IN AGRICULTURAL EDUCATION. — This is an organized effort to promote in the public schools of the State the study of agriculture and practical arts relating to country life. This is accomplished by means of conferences with school officials and school patrons, the promotion of agricultural clubs among the school children, and lectures before granges, farmers' clubs and other interested organizations. The work of the agricultural clubs is under the direction of the superintendent of schools or some one recommended by him. Each town should hold an annual exhibit of products. Exhibits representing rather extensive districts are incorporated with the various agricultural fairs in the State. In this manner elementary instruction in agriculture is promoted by the combined efforts of the public schools, of the patrons of the schools through their agricultural fairs, and of the Agricultural College, which in turn coöperates with the State Board and the National Department of Agriculture.

EXTENSION WORK IN HOME ECONOMICS. — The Extension Service, through its home economics workers, stands ready to assist in solving problems relative to the household in the same manner as it is endeavoring through other workers to aid in working out problems of the farm. The work, among other things, includes lectures and demonstrations, assistance in forming girls' clubs and

home economics clubs for women, and coöperation with existing organizations in the matter of interesting young people in the proper care of the home.

EXTENSION WORK IN COMMUNITY PLANNING. — A number of communities in the State have appealed to the college for aid in bringing the various organizations in the community to a higher state of efficiency, in order that they themselves might take definite steps toward community development and advancement. The college is now prepared to make scientific studies of communities which lead up, by means of surveys, to the organization of local committees to study the agricultural, educational, religious, transportation, recreation and civic needs of the communities. Several State organizations and some national organizations are usually brought in to aid in working out the plans presented by these committees. Conferences on community affairs are held upon request. The college acts merely in an advisory capacity, the communities themselves doing the actual organization work.

LIBRARY EXTENSION WORK. — This consists principally of loaning to public libraries of the State general collections of 10 to 30 books and bulletins on agriculture and related subjects. Special collections of smaller size on specified subjects, such as fruit growing, dairying, poultry, beekeeping, home economics, and so forth, are also sent out. These may be kept from four to eight weeks, according to the demand for them. The only expense to local libraries is transportation charge on the books both ways. The college library also supplies, upon request, information regarding books on agriculture and related subjects.

AGRICULTURAL SURVEYS. — To acquire definite information as to existing conditions in rural communities, to be used as a basis for further extension work, agricultural surveys are made. The different organizations and officials in the community, such as the town officers, superintendent of schools and teachers, clergymen, librarians and others, usually co-operate in making such surveys. The survey covers all phases of community life, including soil survey, farm management practices, and the educational, social, religious and recreational life. The inventory is made upon carefully prepared blanks.

BUSINESS CO-OPERATION AND MARKETING. — This work has for its object the establishment of agriculture on a better business basis. Assistance is given in organization of co-operative buying and selling associations, the securing of rural credit, the adoption of better methods of marketing, the establishment of a better market for agricultural produce, and other lines of agricultural co-operation.

MASSACHUSETTS AGRICULTURAL COLLEGE AGRICULTURAL IMPROVEMENT ASSOCIATION. — This is an organization of ex-students of the college who are now farming in the State, and who have banded themselves together for the purpose of promoting the agricultural development of the State by carrying on experiments and demonstrations for the betterment of rural pursuits, by using and encouraging the use of better seeds and animals, by the organization of co-operative societies, and by the dissemination of literature bearing on recent agricultural investigations. Production of high-grade strains of corn and potatoes for the Massachusetts seed trade and work for the improvement of animals are some of their activities.

DEMONSTRATION FARMS AND PLOTS. — Believing that one of the most effective ways of teaching modern farm practice is by the establishment of demonstrations (not experiments) in all sections of the State, thus showing a man on his own land and under his own conditions the result of proper farm practices, the college is placing demonstration plots throughout the State, showing the

proper fertilization for grass and other crops, the results of rotations, the proper care of orchards and dairy management. For several years the Faunce Demonstration Farm has been under the advisory direction of the college, as is also the Paige farm at Hardwick. The Faunce farm has proved to the Cape Cod region that small fruit, poultry and vegetables can be successfully grown there. Demonstration farms are usually managed by a committee or board of trustees representing the farm and a committee appointed from the college acting jointly.

COUNTY OR DISTRICT AGRICULTURAL AGENTS. — As rapidly as State, government and local funds are available, men trained in agriculture are being assigned to counties and districts of the State to act as agricultural agents. Residents of the county or district may, without cost, call upon the agent for assistance upon any agricultural subject. The work is being supported through the co-operation of the United States Department of Agriculture, the college and the community engaging the agent.

ADVISORY WORK WITH INSTITUTIONS AND INDIVIDUALS. — Special effort is made to comply with as many of the requests of State institutions and individuals who ask for advice on farm problems as possible. The force of instructors available for this work is at present insufficient to take care of all the demands. Special trips, including visits to a number of the various State institutions, are occasionally made by a group of specialists.

PUBLICATIONS OF THE EXTENSION SERVICE. — In addition to the regular circulars and bulletins which announce the various short courses and lines of work mentioned, a monthly pamphlet, "Facts for Farmers," giving timely information on agricultural subjects, is issued. Large numbers of helpful circulars and bulletins are annually distributed. A series of bulletins especially for the farm woman is one feature of this work. Reports of the work of the Extension Service, dairy record blanks, farm account blanks, boys' and girls' club circulars, lists of books, and so forth, may be had upon request.

CO-OPERATION WITH OTHER ORGANIZATIONS. — The aim of the Extension Service is to co-operate with existing organizations so far as possible. It is, therefore, glad to work with local organizations, and welcomes suggestions from town officers, local granges, farmers' clubs, women's clubs, Y. M. C. A.'s, Y. W. C. A.'s, boards of trade, village improvement societies, teachers, clergymen, librarians and others interested in agriculture and country life, as to needs and methods best adapted to the meeting of these needs.

INFORMATION BY CORRESPONDENCE. — Besides the activities mentioned, hundreds are helped through personal visits to farms, and still larger numbers through letters of inquiry, which always receive the most careful attention from every department of the institution.

Pamphlets and bulletins are sent free to all who apply for them, and any who desire such help as has been mentioned should address the Director of the Extension Service, Massachusetts Agricultural College, Amherst, Mass.

GENERAL INFORMATION.

GENERAL INFORMATION.

A. FINANCIAL AND ADMINISTRATIVE.

STUDENT EXPENSES.

TUITION.¹—Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$40 a year. The tuition charged persons not citizens of the United States is \$120 a year. Students entering from Massachusetts are required to file with the president a statement signed by either town or city clerk stating that the applicant's father is a legal resident of Massachusetts; a similar statement is required of those entering from other States.

All students entering the college for the first time as undergraduates or unclassified students are charged a matriculation fee of \$5, which in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

DORMITORIES AND BOARD.—The college has dormitory accommodations for about 62 students. The rooms in the dormitories are occupied by the upper classmen, hence new students find it necessary to room in private houses. The rooms in the college dormitories are unfurnished; for the most part they are arranged in suites of three, — one study room and two bedrooms. These rooms are heated by steam and lighted by electricity; they are cared for by students occupying them. The dormitory rent for each person varies from \$39 to \$66 a year. The rent for furnished rooms in private houses ranges from \$1 to \$3 a week for each occupant. Correspondence in regard to rooms should be addressed to the dean of the college.

Board may be obtained at the college dining hall. At present the price of board there is about \$4 a week. Board is furnished at cost, the price being determined by adding 5 per cent. to the audited rate for the previous three months, and at the end of the period final settlement is made on the basis of actual cost.

EXPENSES.

The necessary college expenses are estimated as follows: —

Tuition: citizens of Massachusetts free; other citizens of the United States, \$40 a year; foreigners, \$120 a year.

	Low.	High.
Matriculation fee, first year,	\$5 00	\$5 00
Room in college dormitories or in private houses,	39 00	110 00
Board in college dining hall, \$4 a week,	144 00	144 00
Laundry, 50 cents to 85 cents a week,	18 00	30 00
Military uniform, first year,	16 40	16 40
Laboratory fees,	2 00	20 00
Books, stationery and miscellaneous items,	15 60	24 60
	<hr/> \$240 00	<hr/> \$350 00

¹ This statement applies to those registering as regular or unclassified students.

OTHER EXPENSES. — Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining a fraternity or entering into other social activities of the college. Students rooming in college dormitories are obliged to equip their own rooms with furniture. The college assumes no responsibility in regard to the safe keeping of student property either during the college term or vacations, except under such special arrangement as may be made with the treasurer. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$275 and \$375 per year.

INITIAL CHARGES.

At the opening of the college year, before students are registered in their classes, the following charges are payable at the treasurer's office: —

	Freshmen.	Sophomores.	Juniors and Seniors.
Matriculation fee,	\$5 00	—	—
Board (if at college dining hall) four weeks in advance,	16 00	\$16 00	\$16 00
Assessment for support of Social Union, . . .	1 00	1 00	1 00
Laboratory fees: —			
Chemistry,	5 00	—	—
Zoölogy,	—	2 00	—
For elective subjects,	—	—	1 00-10 00
Military uniform, ¹	16 40	—	—
Room rent (if in college dormitory),	—	—	19 50-33 00
Student tax for support of athletics, ² . . .	8 00	8 00	8 00
Student tax for support of nonathletic activities, ²	2 50	2 50	2 50

¹ This cost is subject to modification from year to year.

² While this is not essentially a college charge, the treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers; the amount of athletic tax by vote of the student body.

LABORATORY FEES.

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present, the fees charged are as follows: —

Agronomy: —													Per Semester.
Course 3,	.	.	.	.	.	.	.	.	.	.	.	.	\$1 50
Course 4,	.	.	.	.	.	.	.	.	.	.	.	.	50
Courses 5 and 6,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Animal husbandry: —													
Courses 2 and 4,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Course 7,	.	.	.	.	.	.	.	.	.	.	.	.	2 00
Botany: —													
Courses 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,	.	.	.	.	.	.	.	.	.	.	.	.	3 00
Course 4,	.	.	.	.	.	.	.	.	.	.	.	.	2 00
Course 5,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Chemistry: —													
Courses 1, 2, 7, 8, 13, 15,	.	.	.	.	.	.	.	.	.	.	.	.	3 00
Courses 3, 4, 5, 6,	.	.	.	.	.	.	.	.	.	.	.	.	4 00
Courses 9, 10, 11, 12, 14, 16,	.	.	.	.	.	.	.	.	.	.	.	.	5 00
Dairying: —													
Courses 1, 2, 3,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Entomology: —													
Courses 3, 4,	.	.	.	.	.	.	.	.	.	.	.	.	3 00
Landscape gardening: —													
Landscape gardening 1, 2,	.	.	.	.	.	.	.	.	.	.	.	.	2 50
Landscape gardening 3, 4, 7, 8,	.	.	.	.	.	.	.	.	.	.	.	.	3 00
Landscape gardening 6,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Drawing 1, 2,	.	.	.	.	.	.	.	.	.	.	.	.	2 50
Mathematics: —													
Courses 6, 10,	.	.	.	.	.	.	.	.	.	.	.	.	1 00
Microbiology: —													
All courses, each,	.	.	.	.	.	.	.	.	.	.	.	.	5 00
Pomology: —													
Courses 3, 4,	.	.	.	.	.	.	.	.	.	.	.	.	2 50
Poultry Husbandry: —													
Course 3,	.	.	.	.	.	.	.	.	.	.	.	.	1 50
Course 4,	.	.	.	.	.	.	.	.	.	.	.	.	2 00
Zoölogy: —													
Course 1,	.	.	.	.	.	.	.	.	.	.	.	.	2 00
Courses 3, 4,	.	.	.	.	.	.	.	.	.	.	.	.	4 00

STUDENT AID.

SELF HELP. — Many students are obliged to find work of some sort to earn their way through college. A few men have met their entire expenses in this manner, many more have paid a large part of their expenses, and many have earned a small proportion of the cost of their college education; but the college recommends that no new student enter without having at least \$150 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The ordinary student will find it better either to work and accumulate money before coming to college, or to take more than four years in completing his college course, or, instead, to borrow money sufficient to carry him through. No student should under-

take work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

So far as possible needy students will be employed in some department of the college. The divisions of agriculture and horticulture usually afford the most work, although there are several permanent janitorships available for students, and sixty or more students are employed at the dining hall. Application for student labor should be made directly to the President. Applicants are required to present statements from parent or guardian and from a selectman or alderman of the town or city in which they reside, showing that the applicant needs assistance. Students whose deportment or class work is not satisfactory are not likely to be continued in student labor. The most desirable and responsible positions are naturally assigned to those needy students who have been in the institution longest and who have demonstrated their need and ability. Students, therefore, may find it rather difficult to obtain all the work they desire during their freshman year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

SPECIAL NOTICE TO NEEDY STUDENTS.—In the last few years the demand for paid labor on the part of new students has far exceeded the amount of employment that the college can offer. The college cannot promise work to any student, particularly to freshmen; it accordingly urges prospective students who are dependent entirely upon their own efforts not to undertake the course before they have earned enough money to carry them through, or nearly through, the first year.

STUDENT ACCOUNTS.

The following rules are enforced concerning student accounts:—

No student will be allowed to graduate until all bills due the institution from him are paid.

College charges, such as room rent, laboratory fees and tuition, must be paid in advance, at the beginning of each semester. This rule is strictly adhered to, and no student will be allowed to register in his class until such payments are made.

Every student boarding at Draper Hall is required to pay at the beginning of each semester at least one month's board in advance; and no student will be allowed to continue to board at Draper Hall if at any time during the semester he is more than one week in arrears in his payment for board.

All money due for student labor shall at the discretion of the treasurer of the college be applied on account toward any bills that a student may owe to the institution.

STUDENT RELATIONS.

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the president for discipline.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

INFIRMARY.

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students: —

MANAGEMENT OF THE INFIRMARY.

Supervision.

1. The infirmary is under the *general supervision* of Dr. Charles E. Marshall, who is designated as Supervisor of the Infirmary. Miss Florence Levensaler, the resident nurse, is in *immediate* charge of the infirmary.

Use of Infirmary.

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as Professor Hicks gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at the suggestion of Professor Hicks. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

General Health.

3. Students are urged to consult Professor Hicks or Miss Levensaler immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the in-

ipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

General Fee.

4. The infirmary fee will be at the rate of \$1 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights. No charge will be made for miscellaneous treatment of a minor character unless the patient receives one or more meals or remains at the infirmary for one or more nights.

Additional Expenses.

5. In addition to the fee charged, as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(a) *Nurses.*— In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service.*— If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(c) *Supplies.*— Special medical supplies prescribed by a physician or nurse will be charged to the patient. No charge will be made for ordinary medical supplies kept in stock at the infirmary and furnished students in minor cases of illness or accident.

(d) *Laundry.*— Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

B. COLLEGE ACTIVITIES.

GENERAL EXERCISES.

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the president is authorized to excuse from chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

STUDENT ACTIVITIES.

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about six years ago. All students become members of the union by paying a small fee. The union is designed to become the center of student interests. In North College it has a trophy room and a large lounging room for music, reading and study; in the basement of this building there is also a game room for pool and billiards. In the fall and winter months the union gives a series of entertainments, free to students and faculty.

The College Senate is composed of representatives of the junior and senior classes. This body serves as a general director of undergraduate conduct, and represents before the faculty the interests of the student body.

The Young Men's Christian Association is active both socially and religiously. Under its direction voluntary Bible classes are conducted during the winter months. A Catholic club has also been organized.

The musical organizations include an orchestra, a mandolin club and a glee club. These furnish music for college meetings, and occasionally give concerts at the college and at other places. A military band is maintained as part of the cadet corps.

A dramatic club has been organized, and each year presents a play.

The Public Speaking Council represents the students' interest in debate and oratory.

The Athletic Association represents in the college the interests of football, baseball, track, hockey and tennis.

A rifle club has been organized for a few years. Teams representing this club have repeatedly won the intercollegiate championship of the country, both in indoor and outdoor contests.

The college publications are the "Massachusetts Collegian," published weekly by the student body, and the "Index," published annually by the members of the junior class.

The Stockbridge Club is an organization of students especially interested in practical agriculture and horticulture. Regular meetings are addressed by outside speakers, and members present papers and engage in discussions.

Scientific clubs also exist in the Departments of French, Entomology, Landscape Gardening and Zoölogy.

There has recently been organized a Collegiate Country Life Club, the membership of which is composed of faculty and students who are particularly interested in the study of country life problems.

A nonathletics student activities board, composed of alumni, faculty and students, has charge of the finances, schedules, etc., of the musical clubs, dramatic club and student publications.

C. ACADEMIC AND DEPARTMENTAL.

DEGREES.

Those who complete a four-year course receive the degree of bachelor of science. The fee for graduation from the college is \$5.

Graduate students who complete the assigned courses will receive the degree of master of science upon the payment of a fee of \$10. Credit may sometimes be allowed towards this degree for teaching or other advanced work done in some department of the college.

Graduate students who complete the required three-year course of study, and present a satisfactory thesis, will be granted the degree of doctor of philosophy.

Those to whom degrees are awarded must present themselves in person at commencement to receive them. No honorary degrees are conferred.

The honorary fraternity of Phi Kappa Phi has a chapter at the agricultural college. Students are elected to membership to this fraternity on the basis of scholarship. Elections are made from the highest fifth of the senior class who have attained an average grade of at least 85 per cent. during their college course.

PRIZES.

Prizes are given annually in several departments for excellence in study or for other special achievement. Prizes offered in 1914 were:—

AGRICULTURE.—The Grinnell prizes (first, second and third), given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who pass the best, second best and third best examinations, oral and written, in theoretical and practical agriculture. They are \$25, \$15 and \$10.

ANIMAL HUSBANDRY.—The F. Lothrop Ames prize, given by F. Lothrop Ames, Langwater Farms, North Easton, Mass., consisting of \$150 a year, offered for a period of five years, beginning 1912, to be given to the three students standing highest in the work of advanced live stock judging, and to be used in defraying their expenses incurred by participation in the students' judging contest at the National Dairy Show, Chicago.

BOTANY.—The Hills prizes, given by Henry F. Hills of Amherst, amount to \$35 annually. Competition is open to members of the senior, junior and sophomore classes as follows: for the best herbarium, \$20; for the second best herbarium, \$15. No collection deemed unworthy of a prize will be considered.

ENTOMOLOGY.—In 1914 a special prize of \$5 was offered to that member of the junior class presenting the best collection of insects.

GENERAL IMPROVEMENT.—The Western Alumni Association prize (\$25) is given to that member of the sophomore class who, during his first two years in college, has shown the greatest improvement in scholarship, character and example.

PUBLIC SPEAKING.—The Burnham prizes are awarded as follows: to the students delivering the best and second best declamations in the Burnham contest, \$15 and \$10, respectively. The preliminary contests in declamation are open, under certain restrictions, to freshmen and sophomores.

The Flint prizes are awarded as follows: to the students delivering the best and second best orations in the Flint contest, a gold medal and \$20 and \$15, respectively. The preliminary contests in oratory are open, under certain restrictions, to all regular students.

The prizes in debate are awarded as follows: to each of the three students ranking highest in the annual debating contest, a gold medal and \$15. The preliminary contests in debate are open, under certain restrictions, to all regular students.

EQUIPMENT.

AGRICULTURAL EDUCATION.—The courses in this department are planned primarily for those who are preparing to teach. The work is carried on by means of lectures, library and demonstrations. The department has an office, lecture room and a laboratory in the Veterinary Science building. The laboratory is equipped with a balance, dishes, jars, reagent bottles, test tubes, petri dishes, lenses, a Babcock test, a Wisconsin sediment test, Bunsen burner, hot and cold water, electricity, gas and other appliances for giving demonstration and practice lessons in Secondary Agriculture. There is also equipment for conducting children's gardens on the campus. Instruction in school gardens constitutes a part of the practice work of those training for the occupation of teaching. Some practice work in teaching is done in the

grammar grades of the Amherst schools, and in the agricultural departments of Hopkins' Academy, and Smith's Agricultural School at Northampton. This department is also intimately related to the matter of recommending candidates for teachers' certificates. At least four courses in the department are required of students preparing for such certificate. The office is supplied with school and college reports, also a large number of pamphlets and bulletins relating to the subject of agriculture in the schools, courses of study, etc. See note relative to teachers' certificates, under major in Agricultural Education.

AGRONOMY. — The work in agronomy is carried on by means of lecture, laboratory and field work. The soil laboratories are located in the basement of Stockbridge Hall, and include an elementary laboratory with locker equipment for 200 men, and desk space for four divisions of 50 men each, and an advanced soil laboratory for the work of upper classes, with locker space for 80 men. This laboratory is also equipped with balance room, centrifuge room, steam ovens and moisture cabinets. There is also a workroom attached, equipped with power for grinding soils, fodders and the like.

The crop laboratories are located on the second floor of Stockbridge Hall, the room for seed study being at the south end and allowing for sections of 50 men each. The laboratory for cereal and forage crop work is at the north end of the building, and has locker equipment for 64 men. This laboratory is equipped with large steam ovens, constant temperature electric ovens, Brown-Duval moisture apparatus and ovens for seed germination. Attached is a balance room and also a storeroom; while on the fourth floor of Stockbridge Hall is a room equipped for the storage of seed corn, grains and grasses.

ANIMAL HUSBANDRY. — An accurate and definite knowledge of the market types and grades, and of the various breeds of live stock, is fundamental to the work in this department. The department is equipped with an excellent laboratory, Grinnell Arena, which has a seating capacity of 180, and which is fully adapted to the requirements. There are upwards of 125 head of dairy cattle of various ages available for class-room work; among these are included superior representatives of the Jersey, Guernsey, Ayrshire and Holstein breeds. There are flocks of pure-bred Shropshire and Southdown sheep of the best breeding and individuality. Considerable numbers of pure-bred Berkshire and Yorkshire pigs are maintained. The college possesses pure-bred Percherons and French coach horses, besides many work teams of different types, which are available for class-room purposes. A set of plaster of Paris models of individuals of foreign and domestic breeds of horses, cattle, sheep and swine, and a collection of the different foodstuffs available for the use of the New England farmer, are included in the equipment for this work. An excellent set of upward of 250 lantern slides, portraying the leading prize-winning, producing and breeding animals of the leading breeds, — horses, cattle, sheep and swine, — belongs to this department, and is regularly used in instructional work. This equipment is being added to from time to time as funds are available.

BOTANY. — The Department of Botany occupies Clark Hall, a brick building 55 by 95 feet, two stories high, with basement and attic. It has two lecture rooms, one seating 154 and the other seating 72 people; one seminar and herbarium room; a large laboratory for sophomore and junior work, and one for senior work; and three rooms specially fitted for graduate students. The experiment-station laboratories devoted to botanical

research are also in this building. A small museum contains material especially useful in the teaching and illustration of plant phenomena; and on the third floor is a collection of Massachusetts timber trees, specimens showing peculiar formations of plant growth, and various specimens illustrative of scientific methods of treating trees.

The laboratories and lecture rooms are of modern construction, finely lighted and supplied with all necessary conveniences. The basement contains a bacteriological laboratory, a seed and soil room; and a convenient workshop provided with benches for wood and metal work, an electric motor, a power lathe, and other tools and appliances. In the senior laboratory is a room designed especially for physiological work; this laboratory is well supplied also with apparatus for the study of simple phenomena in plant physiology, such as respiration, metabolism, transpiration, heliotropism, etc. The herbarium contains 18,000 sheets of flowering plants and ferns, 1,200 sheets of mosses, 1,200 sheets of lichens and liverworts, and about 20,000 specimens of fungi. The laboratory is equipped with 94 modern compound microscopes and a number of dissecting microscopes, microtomes and a large series of charts. A conservatory 28 by 70 feet is connected with the laboratory. This is designed for experiment work and for housing material often needed in the laboratory.

CHEMISTRY. — The college Department of Chemistry occupies the entire building previously known as the "old chapel." The basement is used for the storage of apparatus and chemicals. The first floor contains large laboratories devoted to organic, physiological and physical chemistry, and qualitative analysis. The second floor is occupied by the general lecture room, by offices for the several members of the staff and by laboratories for analytical chemistry. The third floor has been fitted for work in general chemistry, and has desk room and hoods sufficient to accommodate 66 students at one time. Each place is supplied with reagents and apparatus for independent work. This floor is also occupied by a lecture room that will seat 100 students.

The entire laboratory is well equipped with the necessary apparatus and chemicals for all students who desire to perfect themselves as expert chemists, or who wish to study chemistry as a supplement to some other line of practical or scientific work. The equipment includes a valuable and growing collection of specimens and samples of minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products and artificial preparations of mineral and organic compounds; and also a series of preparations for illustrating the various stages of different manufactures from raw material to finished product.

DAIRYING. — The dairy work is given in Flint Laboratory, a new building designed for the dairy department. It contains large, well-lighted, sanitary and well-equipped laboratories. The equipment is new and of the best types of market milk and farm dairy machines.

DINING HALL. — Draper Hall, a brick colonial building equipped with the modern conveniences of a dining hall, was opened in 1903. The dining service is under the supervision of the college. The building contains a limited number of rooms for young women students.

DRAWING. — The class in drawing occupies a room on the second floor of Wilder Hall. It is equipped with tables and adjustable drawing stands. The necessary materials and implements are provided. The equipment includes drawing models, and plaster casts of leaves, flowers, fruits, human and

architectural details and garden ornaments, two universal drafting machines, an eidograph, centrolineads, a set of ship splines and French curves, complete water-color outfits, automatic crosshatchers and protractors.

ENTOMOLOGY. — *General Entomological Laboratories.* — The equipment for work in entomology is perhaps unexcelled in this country. In the new fire-proof entomological and zoological building, first used in the fall of 1910, are fine lecture rooms, laboratories and museums for use in the different courses. The senior laboratory will accommodate 70 students at one time; a desk, equipped with compound microscope and accessories, together with glassware, reagents, etc., and supplied with electric light and gas, is provided for each student. Dissecting microscopes, microtomes and other apparatus are available for use. The graduate laboratory is similarly equipped, and it will accommodate 20 students. The large and rapidly growing collections of insects are in a room adjoining both laboratories. In the library of the building is an excellent collection of the more important books and journals treating of entomology, and many more are accessible in the college library and in the private libraries of the professors, in all making available more than 25,000 volumes, many of which cannot be found elsewhere in the United States. A card catalogue giving references to the published articles on different insects contains more than 60,000 cards, and is the largest index of its kind in the United States, and probably in the world. In the basement is a pump room where may be studied the construction of the different types of spray pump and methods of repairing them; hose, couplings, nozzles and the other parts of spraying outfits are provided, not only for examination but for use. In another room chemical desks and apparatus provide opportunities for the determination of the impurities and adulterations of insecticides. As the insectary of the Massachusetts Agricultural Experiment Station is in the same building the facilities it offers are also available. A greenhouse, where plants infested with injurious insects are under observation and experimental treatment, is also open to students. Photographic rooms with cameras and other photographic apparatus are provided, and the large greenhouses, gardens, orchards and grounds of the college offer further opportunities for the study of injurious insects under natural conditions.

ENTOMOLOGY. — *Beekeeping.* — For this work the main office, museum and lecture rooms are in the entomological building. There is also an apiary covering approximately two acres which will consist of about fifty colonies of bees in various types of hives and maintained for the several practical and experimental purposes. The apiary also includes a collection of nectar-yielding plants representative of the native flora as well as of the more important nectar sources from other localities. Especial opportunity is therefore given for a study of this fundamental problem of forage. Upon the apiary site is an eight-room building (the first in the world erected exclusively for teaching beekeeping) modeled to meet both the requirements of teaching and of a practical apiary. This building contains a boiler room, capacious wintering cellar, wax extraction room, general carpenter and work shop, laboratory, office, honey extraction room and stock room. The beekeeping equipment also includes an unexcelled collection of apicultural implements, natural history specimens and other curiosities. Practically every device used in American apiculture is available, it being the aim of the department to procure new inventions and implements as fast as they appear for the purpose of study and comparison. Available to the students is a private library of apicultural

literature consisting of upwards of 900 volumes and papers, possibly the most complete collection in the country. This entire equipment is acknowledged unique in model and in completeness for the United States and for the world.

FARM ADMINISTRATION. — The college farm of 250 acres is under the general supervision of the Department of Farm Administration, and furnishes demonstration material. It includes improved land, pasture land and a farm wood lot. The improved land illustrates the value of good culture and the best known methods for the maintenance of fertility. The farm is equipped with suitable buildings and good machinery for the work carried on, of which the production of certified milk is an important branch. Several good farms in the vicinity, illustrating types of both special and general agriculture, may be inspected and studied. The offices of the department are in Stockbridge Hall.

FLORICULTURE. — The Department of Floriculture aims to give the student a thorough knowledge of all phases in greenhouse design and construction and greenhouse heating, and in the culture of florists' crops. It is intended to train men for commercial floriculture and for the management of conservatories on private estates and parks and in cemeteries. The course is outlined to combine theoretical, technical and practical work in the most comprehensive manner possible. Probably no agricultural college has a Department of Floriculture better equipped than this. There has been erected a durable, practical, commercial range, composed of palm, fern, orchid, violet, carnation, rose and students' houses. French Hall, with its large laboratories, class rooms and offices, furnishes excellent facilities for the purposes of instruction. Besides the new glass houses, there are older houses suitable for growing bedding plants and chrysanthemums, and frames for the growing of annual and herbaceous perennial plants, violets and pansies. Many excellent specimens of trees and shrubs are growing on the college grounds, furnishing valuable material for the study of plant materials.

FORESTRY. — The Department of Forestry has an unusually complete equipment of the various instruments used in forest mensuration, forest mapping and engineering, timber estimating, log scaling, board measuring, etc.; a large assortment of boards illustrative of the various commercial woods found in the lumber markets. The State Forest Nursery, comprising 6 acres of land and containing, approximately, 5,000,000 trees, transplants and seedlings, is located on the college farm. Extensive forests containing every variety of tree common to New England are within walking distances of the college. The college campus affords an arboretum containing an exceptionally large number of trees not native to New England. The library contains complete sets of government bulletins, circulars, State reports and all the best books on forestry subjects.

GEOLOGY. — A large, well-lighted laboratory for geology, 27 by 50 feet, is in the basement of the new building for entomology, zoölogy and geology. This is equipped with cabinets, models, charts and a teaching collection of rocks. It has a seating capacity of 50 persons. Adjoining this is a smaller laboratory, 21 by 27 feet, for mineralogy, supplied with gas and cabinets for models, crystals and minerals. There is also a small laboratory for grinding thin sections, and a private laboratory, 6 by 19 feet, for analysis work. The geological museum is 27 by 48 feet. It has six large cases for exhibition purposes. The equipment for geology is being enlarged. At present, in addition to the general items mentioned above, it consists of a petrographic

microscope, an illustrative series of thin sections, a small collection of invertebrate fossils, some casts of vertebrate fossils, a collection of the building stones of Massachusetts, and a duplicate set of the Edward Hitchcock survey collection of the rocks and minerals of Massachusetts.

HEATING, LIGHTING AND POWER. — The college supplies its own light, heat and power, including electricity for the night lighting of the campus and its approaches. The machinery of the barn, the dairy and other buildings is operated by electricity generated at the power-house. The college has also a machine shop and well-equipped carpenter shop.

LANDSCAPE GARDENING. — The work in landscape gardening is developed in a strong technical four-year course; the first two years are occupied with required studies, including botany, horticulture, surveying and mathematics, and the last two years are devoted to more specialized studies in landscape gardening, arboriculture, floriculture, entomology, botany and mathematics. The environment is unusually favorable. The strictly technical work in landscape gardening is taught in light and comfortable drafting rooms, fully furnished with instruments and accessories for thorough work. There is a well-selected library, and the equipment of surveying and drafting instruments is unusually complete and practical.

LIBRARY. — The library — stack room, reading room and office — occupies the entire lower floor of the Chapel-library building. It contains nearly 50,000 volumes and a large number of pamphlets, hitherto inaccessible, but which are being put into good working order as fast as possible. Works of a scientific character predominate, but economics, literature and history are well represented and are receiving due attention. The reading room provides a variety of periodical literature, both technical and popular, encyclopedias and general reference books.

The library is now being reclassified and recatalogued, to make the splendid collection of material here gathered together readily accessible and of the greatest working value. Every effort is being made toward developing the library into a vital intellectual center of college life, of equal value to every student, teacher and teaching department. In consequence, only the most cordial relations are cherished, and the fewest and most imperative rules concerning the circulation of books and deportment are enforced.

Lectures are given to regular and short-course students to enable them to make the best use of the library. Emphasis is laid upon the proper use of the card catalogue, periodical indexes, bibliographies and guides; also, in general, assigned and class-room work, and essay and debate work.

The library hours are from 7.30 A.M. to 9.30 P.M. every week day, and from 9 A.M. to 2 P.M. on Sundays, in term time. Shorter hours prevail during vacation.

MARKET GARDENING. — The purpose of the courses in market gardening is to acquaint the student with the theories and practice of market gardening so that he will be able to carry on the business intelligently. The equipment available for practical work consists of 10 acres of good gardening land; a large collection of horse and hand garden tools; hot-beds and cold-frames; and lettuce, cucumber and tomato houses. The students therefore have opportunity both to study and to practice the important branches of the business. Classes are taught in French Hall, a new building fitted with class rooms and laboratory particularly equipped for market gardening. A good library of works on vegetable gardening is available.

MATHEMATICS AND CIVIL ENGINEERING. — *Surveying*. — The department has a considerable number of the usual surveying instruments, with the use of which the students are required to become familiar by doing field work. Among the larger instruments are 2 plain compasses, a railroad compass with telescope, a surveyor's transit, 3 engineer's transits with vertical arc and level, a Brandis solar transit, a solar compass, an omnimeter with verniers reading to 10 seconds, adapted to geodetic work, a Queen plane table, 3 wye levels, 2 dumpy levels, a builder's level, a sextant, a hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For drafting, a vernier protractor, a pantograph, a parallel rule, etc., are available. The department also has a Fairbanks cement testing outfit.

MILITARY SCIENCE. — This department makes use of the campus for battalion drill, and has a special building in which there is a drill room 60 by 135 feet, an armory, an office for the commandant, a field-gun and gallery practice room and a large bathroom. The national government supplies Krag-Jorgensen rifles, with complete equipments and ammunition. The State supplies instruments for the college band. Students are held responsible for all articles of public property in their possession. The college owns an excellent target range for rifle practice, lying a short distance out of the village.

PHYSICAL EDUCATION. — The gymnasium and armory has a floor space of 5,000 square feet, and is 30 feet high, well lighted and ventilated. The main floor is used for basket ball, indoor baseball and hand ball. The gallery has been fitted up as a special exercise and gymnastic room, and is equipped with modern developing apparatus, including parallel bars, horses, bucks, chest weights, dumb-bells, Indian clubs and striking bags. An outdoor board track enables students to secure track practice through the winter, and two ice hockey rinks give ample opportunity for hockey practice. Credit is given to all students taking part in outdoor activities. "Treks" are held twice a week, and whenever possible snowshoe and skiing hikes are also held. Steel lockers and bathrooms have been installed in North and South colleges, and the gymnasium has been fitted with a shower-room. The gymnasium classes are held the last two hours in the morning and the last two hours in the afternoon, but students may use the gymnasium at other times for exercise purposes by arrangement with the department. The regulation costume for class exercise consists of a white track suit and white rubber-sole shoes.

PHYSICS. — Among the apparatus in use for instruction in general physics are a set of United States standard weights and measures, precision balances, a spherometer, vernier calipers, a projection lantern, etc.; in mechanics, a seconds clock, systems of pulleys and levers, and apparatus to illustrate the laws of falling bodies and motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The department is equipped with the usual apparatus for lecture illustration in heat, light and sound; in electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, including a full set of Weston ammeters and volt meters, a Carhart-Clark standard cell, a Mascart quadrant electrometer, a Siemens electro-dynamometer, and reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistances.

POMOLOGY. — The Department of Pomology has 45 acres of orchard, including apple, pear, peach, plum, cherry and quince trees. Of particular interest is the large collection of these fruits on the various dwarf stocks,

showing many types of training. The recent revival of interest in dwarf fruits makes these dwarf orchards of especial value to students. There are also two commercial vineyards, and a smaller one in which are shown the principal types of trellis and the leading methods of training grapes. Several acres are used in growing the various kinds of small fruits, such as strawberries, raspberries, blackberries, currants and gooseberries. There are also nurseries, where all of these various types of fruits are grown, in which students may see them in all stages of development.

The department has a good equipment of orchard and nursery tools of all the principal types, the use of which enables students to learn the value of each type. For other orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided. For laboratory work in systematic pomology there is a collection of more than 100 wax models of apples, plums, pears and peaches, in natural colors, which are particularly valuable in identifying varieties of these fruits unknown to the student. The laboratory is also furnished with a large number of reference books on pomology; and fruit in a fresh condition is available in great variety, not only from the college orchards but from other parts of Massachusetts and from many other States. In 1912-13, for instance, apples for class use were received from Idaho, Missouri, Utah, Washington, Maine, Connecticut, Pennsylvania, Montana, Minnesota, Nebraska, Kentucky, Iowa, Wisconsin, Michigan, New York, Kansas, Colorado, Oregon, New Jersey and Vermont, besides collections of grapes from California and citrus fruit from Florida and Texas. From the college fruit plantations the following fruits were available: grapes, fifty varieties, representing three native American species and several hybrids; twenty varieties of peaches, twenty varieties of pears, twenty-five varieties of plums, eighty varieties of apples.

POULTRY HUSBANDRY. — The poultry plant consists of about 9 acres of land sloping gently to the west. The soil is a fine, rich, sandy loam, well drained. At present the buildings consist of an incubator cellar, 22 by 34 feet, with a capacity of 4,000 eggs, over which is a demonstration building; a pipe brood house (open-pipe system), 14 by 72 feet, which will accommodate 1,200 chickens; a long laying house, 14 by 180 feet, which accommodates 500 layers and furnishes facilities for student work in pen management; a laboratory, 14 by 80 feet, for killing, picking, dressing, crate fattening, cramming, etc.; a storage building, 28 by 42 feet, for experimental incubation, poultry carpentry, poultry mechanics and storage; an experimental breeding house, 18 by 60 feet; a combination laying, testing and breeding house, 18 by 72, for experimental purposes, and a model laying house, 18 by 30, for 100 hens; the 6 old experiment-station buildings, each 12 by 18 feet, to be used as breeding houses; 14 colony houses; 8 growing crops; a manure shed, 14 by 18 feet; and an oil house, 10 by 12 feet. Instruction in this department is given in the form of lectures, demonstrations and practical work. The practical work consists of poultry carpentry, caponizing, killing, picking, dressing, packing and selling poultry; pen management and fattening; running incubators and brooders, etc. At present the stock consists of 20 leading varieties of poultry. The aim of the department is to keep good specimens of all the most popular varieties of chickens, ducks and geese, so that a thorough course in poultry judging may be given, and that visitors may find the inspection of our stock an education in itself.

PUBLIC SPEAKING. — In connection with the work in public speaking, three regular contests are held during the year. The Burnham contest in declamation is open to freshmen and sophomores; the Flint contest in oratory and the annual debating contest are open (under restrictions) to all regular students. These contests offer a very practical and necessary experience to all students interested in improving themselves in the art of public speaking. Prizes are given for excellence in the contests. Intercollegiate contests are arranged by the Public Speaking Council. One credit is given, except to freshmen, for a year of work in the College Debating Club.

RURAL ENGINEERING. — This department has an office and the use of a lecture room in Stockbridge Hall. The work on farm structures is given in the large drawing room in the same building. This room is fitted with thirty drawing tables. Models and blue prints are available for the study of farm buildings.

The work on farm machinery and farm motors is given in the Rural Engineering building. This is a one-story structure 34 by 68 feet. The equipment includes gasoline engines and pumps and a complete line of farm field machines. A small dynamo and switchboard are used in the study of farm lighting systems. The study of post molds and a machine for making cement tile afford opportunity for practical work with cement.

The work on the small field machines is given in the basement of Stockbridge Hall.

Work on steam engines and steam heating is given in Flint Laboratory.

RURAL JOURNALISM. — The news-room, or laboratory, for the courses in rural journalism, is equipped with typewriting machines, copy tables, representative newspapers, reviews, agricultural papers, and trade journals concerning journalism and writing, selected books on journalism, reference books, and a considerable "morgue" of indexed pamphlets and monographs on farming, rural life and rural industry (loan collection). The news-room is in the recently completed Stockbridge Hall, with the division library of the Division of Agriculture, and is kept open until 10 P.M.

VETERINARY SCIENCE. — The Department of Veterinary Science occupies a modern laboratory and hospital stable, built in accordance with the latest principles of sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There is a lecture hall, a museum, a demonstration room, a photographing room and a workshop. The hospital stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern, high-power microscopes, microtomes, incubators and sterilizers, for work in every department of veterinary science including pathology, serology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

ZOÖLOGY. — The college offers increased facilities for the study of zoölogy. In the new building for entomology, zoölogy and geology are spacious laboratories for both undergraduate and graduate work. On the first floor is a large sophomore laboratory, 27 by 100 feet, with a present seating capacity of 100 persons. Adjoining this is a smaller room, 20 by 27 feet, for junior and senior courses. All laboratories are equipped with gas. The equipment consists of 80 compound microscopes and accessories, 70 dissecting microscopes, microtomes and accessories, paraffine baths, incubator, dissecting instruments, glassware and other necessary apparatus.

The large amphitheater lecture hall is used jointly by the Departments of Entomology and Zoölogy-Geology. It is equipped with charts and models. The zoölogical museum is drawn upon at all times for illustrative material. The zoölogical museum is 27 by 48 feet. The main room is on the first floor of the building. Above this, on a level with the second floor, is a large gallery. On the main floor are 8 large wall cases and 5 large floor cases for exhibition purposes. The gallery has 1 large wall case and 3 floor cases with space for 9 additional cases. The zoölogical collection consists of nearly 12,000 specimens. All the chief phyla are represented. Adjoining the museum is a preparator's room for the curator. The museum is open to the public from 1 to 5 P.M. on Saturdays, and on other week days from 3 to 6 P.M. The curator is Associate Professor Gordon.

LIST OF AWARDS AND PRIZES, 1915.

GRINNELL PRIZES. — The Grinnell prizes, given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who pass the best, second best and third best examinations, oral and written, in theoretical and practical agriculture, were awarded as follows: —

First prize, \$25, awarded to Philip Ferry Whitmore.

Second prize, \$15, awarded to Ralph P. Hotis.

Third prize, \$10, awarded to Waldo Atwood Cleveland.

GENERAL IMPROVEMENT. — The Western Alumni Association prize, given to that member of the sophomore class who, during the first two years in college, has shown the greatest improvement in scholarship, character and example, was \$25. Awarded to Daniel Johnston MacLeod.

HILLS BOTANICAL PRIZES. — Hills prizes for the best and second best herbarium, competition open to members of the senior, junior and sophomore classes, were awarded as follows: —

First prize of \$20 awarded to Ernest Elwood Stanford of the senior class.

Second prize of \$15 awarded to Dana Otis Merrill of the sophomore class.

PUBLIC SPEAKING (previously announced). — The Burnham prizes were awarded to the students delivering the best and second best declarations, as follows: —

First prize, \$15, awarded to N. N. Worthley, 1918.

Second prize, \$10, awarded to L. E. Wolfson, 1918.

The Flint prizes were awarded to the students delivering the best and second best orations, as follows: —

First prize, \$20, awarded to H. L. Russell, 1918.

Second prize, \$15, awarded to L. D. Kelsey, 1917.

Interclass Debate. — Won by the Freshman Debating Team, composed of D. M. Lipshires, \$15, H. L. Russell, \$15, and L. E. Wolfson, \$15.

Prize College Debate. — H. K. Foster, 1918, D. M. Lipshires, 1918, and H. L. Russell, 1918, — silver cup to each.

MILITARY HONORS. — The following-named cadet officers have been reported to the Adjutant-General of the United States army and to the Adjutant-General of the Commonwealth of Massachusetts as being efficient in military science and tactics and graduating therein with highest honors: —

Cadet Col. D. J. Lewis.
 Cadet Maj. P. F. Whitmore.
 Cadet Maj. A. E. Wilkins.
 Cadet Capt. E. C. Towne.
 Cadet Capt. H. H. White.
 Cadet Capt. R. W. Harvey.

Cadet Capt. A. J. Flebut.
 Cadet Capt. S. K. Farrar.
 Cadet Capt. M. J. Clough.
 Cadet Capt. R. E. McLain.
 Cadet Capt. G. F. Hyde.
 Cadet Capt. H. D. Grant.

SECRETARIES OF ALUMNI ASSOCIATIONS.

Associate Alumni of the Massachusetts Agricultural College.

Secretary: Dr. CHARLES A. PETERS, 1897, Amherst, Mass.

Alumni Secretaries' Association of the Massachusetts Agricultural College.

Secretary: RALPH J. WATTS, 1907, Amherst, Mass.

Alumni Club of Massachusetts.

Secretary: P. W. PICKARD, 1911, 43 Chatham Street, Boston, Mass.

Connecticut Valley Association of the Massachusetts Agricultural College.

Secretary: PAUL E. ALGER, 1909, Great Barrington, Mass.

Massachusetts Agricultural College Club of New York.

Secretary: Dr. JOHN ASHBURTON CUTTER, 1882, 266 West 77th Street, New York, N. Y.

Massachusetts Agricultural College Club of Washington, D. C.

Secretary: Dr. WILLIAM A. HOOKER, 1900, U. S. D. A., Office of Experiment Stations, Washington, D. C.

Western Alumni Association of the Massachusetts Agricultural College.

Secretary: CHARLES A. TIRRELL, 1906, 815 Steinway Hall, Chicago, Ill.

Massachusetts Agricultural College Pacific Coast Alumni Association.

Secretary: THOMAS F. HUNT, 1905, Berkeley, Cal.

Massachusetts Agricultural College Club of Hawaii.

Secretary: Dr. E. A. BACK, 1904, Honolulu, T. H.

Class Secretaries.

Class of	SECRETARY.	Secretary's Address.
1871	E. E. Thompson, .	5 Jacques Avenue, Worcester, Mass.
1872	F. E. Kimball, .	8 John Street, Worcester, Mass.
1873	C. Wellington, .	Amherst, Mass.
1874	D. G. Hitchcock, .	Warren, Mass.
1875	— —	— —
1876	C. Fred Deuel, .	Amherst, Mass.
1877	Atherton Clark, .	231 Waverley Avenue, Newton, Mass.
1878	C. O. Lovell, .	201 Darke Block, Regina, Saskatchewan, Can.
1879	R. W. Swan, .	41 Pleasant Street, Worcester, Mass.
1880	Alvan L. Fowler, .	413 Post Office Building, Philadelphia, Pa.
1881	J. L. Hills, .	59 North Prospect Street, Burlington, Vt.
1882	G. D. Howe, .	25 Winter Street, Bangor, Me.
1883	J. B. Lindsey, .	Amherst, Mass.
1884	E. A. Jones, .	New Canaan, Conn.
1885	E. W. Allen, .	1923 Biltmore Street, Washington, D. C.
1886	Winfield Ayres, .	616 Madison Avenue, New York City.
1887	F. H. Fowler, .	Shirley, Mass.
1888	H. C. Bliss, .	14 Mechanic Street, Attleboro, Mass.
1889	F. W. Davis, .	85 Colberg Avenue, Roslindale, Mass.
1890	David Barry, .	398 Walnut Street, Newtonville, Mass.
1891	H. T. Shores, .	177 Elm Street, Northampton, Mass.
1892	H. M. Thomson, .	Amherst, Mass.
1893	F. A. Smith, .	Hathorne, Mass.
1894	S. F. Howard, .	Northfield, Vt.
1895	E. A. White, .	Ithaca, N. Y.
1896	A. S. Kinney, .	South Hadley, Mass.
1897	C. A. Peters, .	Amherst, Mass.
1898	W. S. Fisher, .	Peace Street Grammar School, Providence, R. I.
1899	D. A. Beaman, .	Rio Piedras, Porto Rico.
1900	E. K. Atkins, .	15 Hubbard Avenue, Northampton, Mass.
1901	J. H. Chickering, .	Dover, Mass.
1902	H. L. Knight, .	1420 Buchanan Street, Washington, D. C.
1903	G. D. Jones, .	North Amherst, Mass.
1904	P. F. Staples, .	Sherborn, Mass.
1905	A. D. Taylor, .	1900 Euclid Avenue, Cleveland, O.
1906	Richard Wellington, .	St. Anthony Park, Minnesota.
1907	Clinton King, .	31 Elm Street, Springfield, Mass.
1908	S. T. Wright, .	17 Camp Street, Norwalk, Conn.
1909	O. B. Briggs, .	1015 Fidelity Building, Baltimore, Md.
1910	F. L. Thomas, .	Auburn, Ala.
1911	L. M. Johnson, .	Newtown, Conn.
1912	F. S. Madison, .	East Greenwich, R. I.
1913	B. W. Ellis, .	Bournedale, Mass.
1914	L. Ernest Smith, .	Colchester, Conn.
1915	P. F. Whitmore, .	Sunderland, Mass.

DEGREES CONFERRED AND
ROLL OF STUDENTS.



DEGREES CONFERRED—1915.

DOCTOR OF PHILOSOPHY (Ph.D.).

Holland, Edward Bertram, Amherst, Mass., Massachusetts Agricultural College, M.Sc.
 Hutson, John Coghlan, Barbados, W. I., Massachusetts Agricultural College, M.Sc.
 Martin, James Francis, Amherst, Mass., Massachusetts Agricultural College, M.Sc.
 Parker, Ralph Robinson, Malden, Mass., Massachusetts Agricultural College, M.Sc.
 Regan, William Swift, Northampton, Mass., Massachusetts Agricultural College, B.Sc.

MASTER OF SCIENCE (M.Sc.).

Bogue, Robert Herman, North Amherst, Mass., Tufts College, B.Sc.
 Brown, Henry Leavitt, Ayer, Mass., University of Maine, B.Sc.
 Hasey, Willard Harrison, Brockton, Mass., Massachusetts Agricultural College, B.Sc.
 Norton, John Buck, Hartford, N. Y., University of Vermont, B.Sc.
 Root, George Albert, Danbury, Conn., Connecticut Agricultural College, B.Sc.

BACHELOR OF SCIENCE (B.Sc.).

Alden, Charles Harold,	Amherst.
Allen, Francis Ellwood,	Melrose.
Archibald, Herbert Hildreth,	Waltham.
Banister, Seth Warrenner,	Westford.
Bartlett, Edward Russell,	Newburyport.
Bartley, Hastings Newcomb,	Sandwich.
Bemis, Willard Gilbert,	North Brookfield.
Bennett, John Ingram,	Boston.
Bishop, Chester Allen,	Peterboro, N. H.
Brooks, Gardner Milton,	Boston.
Buell, Frank Weed,	New Haven, Conn.
Burt, Helen Frances,	West Somerville.
Buttrick, John Willard,	Melrose.
Cale, Gladstone Hume,	Springfield.
Cande, Donald Hopkins,	Pittsfield.
Chase, Alexander Baxter, Jr.,	West Barnstable.
Clark, Ellis Fred,	Granby, Conn.
Cleveland, Waldo Atwood,	Baldwinsville.
Clough, Maurice Joseph,	Boston.
Dalrymple, Andrew Campbell,	Revere.
Damon, Leon Blanchard,	Melrose.
Day, George Allen,	Warren.
Dole, Sumner Alvord,	Shelburne.
Doran, William Leonard,	North Dartmouth.
Draper, Earle Sumner,	Milford.
Farrar, Stuart Kittridge,	Springfield.
Fitzgerald, Daniel James,	Worcester.
Flebut, Alpha John,	Amherst.
Frost, Robert Theodore,	New York, N. Y.
Fuller, Richard,	Salem.
Goodwin, Malcolm Noyes,	Newburyport.
Grant, Harold Davidson,	Methuen.
Griggs, Raymond Bradford,	Chicopee Falls.
Hall, George Morris,	Brookline.
Hall, Roderick Chesley,	Worcester.
Harper, James Edward,	New Haven, Conn.
Harvey, Russell Wilton,	Lanesville.

Haskell, Willis Henry, Jr.,	Brooklyn, N. Y.
Hatfield, William Hollis,	Wellesley.
Hildreth, Paul Hughes,	Newtonville.
Hotis, Ralph P.,	Evans Mills, N. Y.
Hyde, George Frederick,	Hartford, Conn.
Hyde, Harold Gilmore,	Winchendon.
Johnson, Arthur,	Bridgeport, Conn.
Kelleher, Jerome Joseph,	Turners Falls.
Kennedy, Worthington Chester,	Hardwick.
Lane, Merton Chesleigh,	South Duxbury.
Le Duc, Ashley Cudworth,	Chesterfield.
Lewis, Daniel James,	Hanson.
Lewis, John Kirby,	New Haven, Conn.
Lincoln, Irving Boin,	Glens Falls, N. Y.
Lovejoy, John Sumner,	Newburyport.
MacNeil, Ralph Langdel,	Chelsea.
Macy, Philip Arthur,	Oak Bluffs.
Marsh, Franklin Winter,	Amherst.
Marsh, Herbert Verner,	Deerfield.
Massé, Sidney Merton,	Dorchester.
McKechnie, Ray Farrar,	Natick.
McLain, Ralph Emerson,	Melrose.
Melican, George Deady,	Worcester.
Moberg, Eldon Samuel,	Campello.
Montague, Enos James,	Northampton.
Moore, Roger Henry,	Beverly.
Navas, Miguel,	Barranquilla, Colombia, S. A.
Parker, Edwin Kenney,	Northampton.
Parmenter, Ernest Brigham,	Franklin.
Patterson, Robert Earley,	Dorchester.
Pendleton, Harlow Libby,	Dorchester.
Perry, Gerald Eugene,	Amherst.
Pike, Joseph Stevens, Jr.,	Somerville.
Potter, George Raymond,	Ludlow.
Price, James Albert,	New York, N. Y.
Rhoades, Paul Whitney,	Malden.
Rogers, Harold Merriman,	Southington, Conn.
Sauchelli, Vincent,	Waterbury, Conn.
Sears, William Richard,	Woburn.
Severance, Verne Lincoln,	South Hanson.
Sherman, Milton Francis,	South Lincoln.
Simon, Isaac Barney,	Revere.
Slein, Owen Francis,	New Braintree.
Smith, Hyde,	Worcester.
Spicer, Eber Grant,	New York, N. Y.
Spofford, Chester Porter,	South Groveland.
Stanford, Ernest Elwood,	Amherst.
Tarr, Lester Winslow,	Rockport.
Tower, Ralph Ernest,	Becket.
Tower, William Reginald,	Sheffield.
Towne, Edwin Chester,	Waltham.
Upton, Raymond Melville,	Peabody.
Vener, Benjamin,	Brockton.
Vinal, Stuart Cunningham,	Boston.
Walker, Herman Chester,	Holyoke.
Wellington, Benjamin,	Waltham.
White, Henry Harrison,	West Peabody.
Whitmore, Philip Ferry,	Sunderland.
Whorf, Paul Francis,	Caribou, Me.
Wilkins, Alfred Emerson,	Wakefield.
Wiley, Harold Cleland Clancey,	Orange.
Williams, Donald,	Catasauqua, Pa.
Wright, Elvin Stanley,	Worcester.
Zehrunge, Samuel Danford,	Roseville, O.

ROLL OF STUDENTS.

GRADUATE STUDENTS — CANDIDATES FOR A DEGREE.

Anderson, David Wadsworth,	Manchester, N. H.
B.Sc., New Hampshire State College.	
Armstrong, Robert Pierson,	Rutherford, N. J.
B.Sc., Massachusetts Agricultural College.	
Avery, Roy Crowdy,	New York City.
B.Sc., Connecticut Agricultural College.	
Baird, Charles Glenn,	Powell, Wyo.
A.B., University of Kansas; A.M., University of Wyoming.	
Bales, Harold C.,	North Amherst.
A.B., Dartmouth College.	
Beals, Carlos Loring,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Bourne, Arthur Israel,	Amherst.
A.B., Dartmouth College.	
Bronson, Wesley Hotchkiss,	Amherst.
B.Sc., New York State College of Agriculture.	
Chapman, George Henry,	Amherst.
B.Sc. and M.Sc., Massachusetts Agricultural College.	
Christopher, Paul F.,	Hadley.
B.Sc., Colby College.	
Clapp, Raymond K.,	Easthampton.
B.Sc., Massachusetts Agricultural College.	
Cobb, J. Stanley,	Groton, N. Y.
B.Sc., Cornell University.	
Copson, Godfrey V.,	Corvallis, Ore.
B.Sc. in agriculture, Oregon Agricultural College.	
Davies, Ernest Langford,	Guelph, Can.
B.Sc., Ontario Agricultural College.	
Doran, William Leonard,	North Dartmouth.
B.Sc., Massachusetts Agricultural College.	
Erichsen, Alexander J.,	Atlantic City, N. J.
B.Sc., Pennsylvania State College.	
Fish, Ernest Ellsworth,	Wyalusing, Pa.
B.Sc., Pennsylvania State College.	
Flebut, Alpha John,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Hood, Egerton Gibson,	Hagermon, Ontario,
B.Sc.A., Ontario Agricultural College.	Can.
Itano, Arao,	Okayamaken, Japan.
B.Sc., Michigan Agricultural College.	
Johnson, Leonard H.,	Monticello, India.
B.S. in agriculture, Purdue University.	
Lund, Russell Fort,	Amherst.
B.A., St. Lawrence University.	
MacDougall, Allister F.,	Northampton.
B.Sc., Massachusetts Agricultural College.	
MacNeil, Ralph Langdel,	Chelsea.
B.Sc., Massachusetts Agricultural College.	

McKechnie, Ray F.,	Natick.
B.Sc., Massachusetts Agricultural College.	
Merkle, Frederick Grover,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Morgan, Ezra L.,	Amherst.
A.B., McKendree College; M.A., University of Wisconsin.	
Mutkekar, Satwaji Gundoji,	Belgaum, Ind.
B.Agr., Poona Agricultural College.	
Payne, William Thomas,	Oklahoma City, Okla.
Oklahoma Agricultural and Mechanical College.	
Peckham, Curtis,	New Bedford.
B.Sc., Massachusetts Agricultural College.	
Perry, Gerald Eugene,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Phillips, Arthur W.,	Somerville.
B.Sc. in chemistry, Tufts College.	
Porter, Bennett Allen,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Read, Frederick W.,	Boston.
B.Sc., Massachusetts Agricultural College.	
Root, Irving C.,	Kansas City, Kan.
B.Sc., Kansas State Agricultural College.	
Ruprecht, Rudolph W.,	Flatbush, N. Y.
B.Sc. and M.Sc., Massachusetts Agricultural College.	
Serex, Paul, Jr.,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Smith, Raymond Goodale,	Lynn.
B.Sc., Massachusetts Agricultural College.	
Strand, Carl J.,	Amherst.
A.B., Augustana College; M.S., University of Illinois.	
Taylor, Leland H.,	Peabody.
B.Sc., Massachusetts Agricultural College.	
Thurston, Arthur S.,	Everett.
B.Sc., Massachusetts Agricultural College.	
Vinal, Stuart C.,	East Weymouth.
B.Sc., Massachusetts Agricultural College.	
White, Donald,	Wakefield.
A.B., Harvard College.	
White, Edward Albert,	Ithaca, N. Y.
B.Sc., Massachusetts Agricultural College.	

GRADUATE STUDENTS — NOT CANDIDATES FOR A DEGREE.

Emery, Barton C.,	Amherst.
A.B., Bowdoin College.	
Fenn, Donald F.,	Cambridge.
A.B., Harvard College.	
Harris, Margaret,	Deerfield.
A.B., Wellesley College.	
Karlson, Hugo P.,	Orange.
A.B., Clark College.	
Lovejoy, John Sumner,	Newburyport.
B.Sc., Massachusetts Agricultural College.	
Middleton, Frederick Heard,	Brookline.
A.B., Harvard University.	
Morgan, Denison,	New Haven, Conn.
A.B., Yale University.	
Porter, Margaret Love,	Amherst.
M.A., Columbia University.	

SENIOR CLASS.

Aiken, Harold,	Millis,	Lambda Chi Alpha.
Anderson, Frank Albert, ¹	Somerville,	Phi Sigma Kappa.
Andrews, Francis Marshall, Jr.,	Manchester,	53 Lincoln Avenue.
Barnes, Dwight Fletcher,	Bedford,	East Experiment Station.
Barnes, Fred Leslie Walker, ¹	Plymouth,	16 South College.
Bishop, Herbert Walker,	Doylestown, Pa.,	Alpha Sigma Phi.
Blanpied, Nelson Uhler,	Framingham,	13 South College.
Boyer, Edward Everett Hale, ¹	Lynn,	5½ East Pleasant Street.
Brazil, William Henry,	Leominster,	12 South College.
Caldwell, Harold Nute, ¹	Lowell,	M. A. C. Farm House.
Cardarelli, Emilio Joseph,	Boston,	West Experiment Station.
Chase, Esther Helen,	Holden,	Draper Hall.
Chisholm, Raymond Lincoln,	Melrose Highlands,	Phi Sigma Kappa.
Clapp, Raymond Luckey,	Northfield,	11 South College.
Clark, Saxon Dickinson,	Springfield,	2 South College.
Coe, Alfred Lynn,	Fayetteville, N. Y.,	Beta Kappa Phi.
Coleman, Albert Sumner,	Mendon,	11 South College.
Coley, William Stanton, ¹	Wilton, Conn.,	15 North College.
Courchene, Alcide Telesphor, ¹	North Adams,	Mount Pleasant.
Curran, Harry Ambrose,	Marlborough,	2 North College.
Cushing, Raymond Alonzo, ¹	West Somerville,	14 South College.
Danforth, George Newlon, ¹	Foxcroft, Me.,	Kappa Sigma.
Darling, Homer Chester,	Mendon,	7 South College.
Davis, Frank Leslie,	Milford,	South College.
Dickinson, William Cows,	North Amherst,	North Amherst.
Dodge, Walter Eugene,	Geneva, O.,	14 South College.
Eldredge, Raymond Chase,	North Abington,	2 South College.
Estes, Ralph Cary, ¹	South Framingham,	15 South College.
Fernald, Charles Henry, 2d,	Amherst,	44 Amity Street.
Fielding, Lester Edward, ¹	Malden,	1 South College.
Gaventa, Harry Reymer,	Swedesboro, N. J.,	11 North College.
Gilmore, Benjamin Anthony,	Acushnet,	Beta Kappa Phi.
Gioiosa, Alfred Anthony,	Dorchester,	Alpha Sigma Phi.
Glover, Theodore Whitford,	South Duxbury,	Lambda Chi Alpha.
Goodwin, Clinton Foster,	Haverhill,	Lambda Chi Alpha.
Googins, Burton,	Amherst,	Baker Place.
Gould, Charles Holt,	Hubbardston,	Theta Chi.
Gunn, Carlton Merrick,	Sunderland,	Beta Kappa Phi.
Hager, Clayton Marden,	Somerville,	13 South College.
Hall, Stanley William,	Saxonville,	3 South College.
Harris, William Lombard, Jr.,	Deerfield,	53 Lincoln Avenue.
Harrocks, Thomas Lincoln,	Westminster,	15 North College.
Hart, Reginald,	Montague City,	10 North College.
Haskell, Frank Eugene,	Northborough,	11 North College.
Hathaway, Charles Edward, Jr.,	Somerset,	13 South College.
Hemenway, Justin Stanley,	Williamsburg,	9 North College.
Hendry, Arthur Ekman, ¹	Milton,	M. A. C. Apiary.
Hicks, Albert James,	Amherst,	4 Chestnut Street.
Holden, Mae Faustina,	Royalston,	Draper Hall.
Hunt, Reginald Stuart, ¹	Newtonville,	2 South College.
Huntington, Charles Albert, Jr.,	Poquonock, Conn.,	Kappa Sigma.
Jerome, Fred William,	Stockbridge,	9 South College.
Jones, Linus Hale,	Milford,	Mount Pleasant.
Jordan, Perley Balch,	Topsfield,	14 South College.
Kelly, Harold Russell,	Haverhill,	Pease Avenue.
Kilbon, Ralph Gillette,	Springfield,	4 South College.
King, Edward Lee,	Norwood,	8 South College.
Knapton, Guy Lord, ¹	Lawrence,	Pease Avenue.
Laird, Kenneth Bradford,	Brockton,	79 Pleasant Street.

¹ Work incomplete.

Lieber, Conrad Hugo, . . .	Jamaica Plain, . . .	3 North College.
Lindquist, Albert Evert, . . .	Roxbury, . . .	3 North College.
Little, Harold Greenleaf, . . .	Newburyport, . . .	4 South College.
Locke, Wilbur Trow, . . .	Lawrence, . . .	Alpha Sigma Phi.
Lyford, Waldo Preston, . . .	Natick, . . .	13 South Prospect Street.
Mahan, Harold Butterworth, . . .	Manchester, N. H., . . .	15 South College.
Mattoon, Harold Gleason, ¹ . . .	Pittsfield, . . .	12 South College.
Mooney, Raymond Alson, . . .	Plattsburgh, N. Y., . . .	Alpha Sigma Phi.
Moses, Charles Wicker, . . .	Ticonderoga, N. Y., . . .	3 South College.
Mostrom, Harold Augustus, . . .	North Middleborough, . . .	10 Nutting Avenue.
Murphy, John William, . . .	Beverly, . . .	Phi Sigma Kappa.
Nash, Clayton Wells, . . .	South Weymouth, . . .	12 North College.
Nicholson, James Thomas, ¹ . . .	Leominster, . . .	12 South College.
Palmer, George Bradford, . . .	Brookline, . . .	3 South College.
Perry, Edgar Adams, . . .	Attleboro, . . .	Alpha Sigma Phi.
Plaisted, Philip Asbury, . . .	Arlington, . . .	Phi Sigma Kappa.
Potter, David, . . .	Concord, . . .	20 South College.
Prouty, Stanley Marshall, . . .	North Brookfield, . . .	Kappa Sigma.
Ray, George Burrill, . . .	Hingham, . . .	3 North College.
Rich, Gilbert Warren, ¹ . . .	Hingham, . . .	15 South College.
Richards, Everett Stackpole, . . .	Hatfield, . . .	1 South College.
Ricker, Dean Albert, ¹ . . .	Worcester, . . .	7 North College.
Rogers, Tyler Stewart, . . .	Framingham, . . .	Phi Sigma Kappa.
Rowe, Louis Victor, ¹ . . .	Melrose, . . .	16 South College.
Russell, Ernest Samuel, . . .	South Hadley, . . .	Kappa Sigma.
Ryan, William Edward, Jr., . . .	Stoughton, . . .	12 North College.
Sander, Benjamin Charles Louis, . . .	Cambridge, . . .	Theta Chi.
Sanderson, Everett Shovelton, . . .	Centreville, R. I., . . .	12 North College.
Scheufele, Frank Joseph, . . .	South Natick, . . .	Phi Sigma Kappa.
Schlotterbeck, Lewis, . . .	Roxbury Station, Conn., . . .	Alpha Sigma Phi.
Selkregg, Edwin Reimund, ¹ . . .	North East, Pa., . . .	10 South College.
Sherinyan, Donald Suran, ¹ . . .	Los Angeles, Cal., . . .	5 North College.
Simmons, Perez, . . .	Pittsfield, . . .	Lambda Chi Alpha.
Stearns, Frederick Campbell, ¹ . . .	Waltham, . . .	10 North College.
Strauss, Abraham, . . .	Roxbury, . . .	Clark Hall.
Swan, Durelle, . . .	Dorchester, . . .	18 Nutting Avenue.
Taber, Ralph Fred, . . .	Cooperstown, N. Y., . . .	Mount Pleasant.
Topham, Alfred, ¹ . . .	Lawrence, . . .	13 North College.
Upham, Thomas Carlton, . . .	Fitchburg, . . .	53 Lincoln Avenue.
Verbeck, Howard Graves, . . .	Malden, . . .	Phi Sigma Kappa.
Walkden, Herbert Halden, . . .	Westford, . . .	2 North College.
Walker, Henry Marshall, ¹ . . .	Brookline, . . .	2 North College.
Wentworth, Everett Lawrence, . . .	East Dover, Vt., . . .	M. A. C. Plant House.
Wetherbee, Raymond Scott, . . .	Waltham, . . .	11 North College.
Whitney, Harold Tichenor, ¹ . . .	Mount Vernon, N. Y., . . .	7 North College.
Whitney, Leon Fradley, . . .	Brooklyn, N. Y., . . .	Kappa Sigma.
Wies, Calmy, . . .	Malden, . . .	31 Pleasant Street.
Wildon, Carrick Earl, . . .	Melrose Highlands, . . .	14 North College.
Woolley, Harold Curtis, ¹ . . .	Malden, . . .	4 South College.

JUNIOR CLASS.

Babcock, Philip Rodney, ¹ . . .	Lynn, . . .	Kappa Sigma.
Barnes, Herbert Wesley, . . .	Whitinsville, . . .	Commons Club.
Behrend, Oswald, . . .	Natick, . . .	Commons Club.
Bell, Alfred Whitney, Jr., ¹ . . .	West Newton, . . .	53 Lincoln Avenue.
Birchard, John Dixon, ¹ . . .	Springfield, . . .	Phi Sigma Kappa.
Boles, Robert Stewart, . . .	Dorchester, . . .	Beta Kappa Phi.
Bonn, Wesley Copeland, . . .	Grafton, . . .	Commons Club.
Booth, Alfred, ¹ . . .	Middletown, N. Y., . . .	Baker Place.
Boyce, Harold Prescott, ¹ . . .	Haverhill, . . .	7 Nutting Avenue.
Buckman, Lewis Taylor, . . .	Wilkes-Barre, Pa., . . .	Theta Chi.

¹ Work incomplete.

Buttrick, David Herbert,	Arlington,	Phi Sigma Kappa.
Carruth, Glenn Howard, ¹	Orange,	Physics Building.
Chamberlin, Frank Shirley,	Framingham,	Commons Club.
Clough, Charles Henry, ¹	Dedham,	Beta Kappa Phi.
Cross, Walter Irving, ¹	Hingham Center,	53 Lincoln Avenue.
Curtin, Charles Warren, ¹	Newton,	Lambda Chi Alpha.
Davis, Monsell Henry,	Orange, N. J.,	120 Pleasant Street.
Day, James Harold, ¹	Hatfield,	8 North College.
Dempsey, Paul Wheeler,	Dorchester,	Lambda Chi Alpha.
Dickey, Harold McCamell,	Dorchester,	6 South College.
Dizer, John Thomas,	East Weymouth,	East Experiment Station.
Duffill, Edward Stanley,	Melrose Highlands,	8 Allen Street.
Dunham, Henry Gurney, ¹	West Bridgewater,	Beta Kappa Phi.
Edwards, Francis Gill, ¹	Beverly,	Phi Sigma Kappa.
Elliot, Ralph William,	Chartley,	Flint Laboratory.
Everbeck, George Charles, ¹	Boston,	87 Pleasant Street.
Fearing, Ralph Watson,	Dorchester,	Commons Club.
Fisher, George Basil, ¹	Millbury,	Theta Chi.
Flagg, Wayne McCrillis, ¹	Mittineague,	Beta Kappa Phi.
Flint, Oliver Simeon,	Lowell,	120 Pleasant Street.
Goldstein, Maurice, ¹	Lynn,	58 Pleasant Street.
Graham, Leland Jenkins, ¹	Amherst,	Lincoln Avenue.
Grayson, Emory Ellsworth,	Milford,	Alpha Sigma Phi.
Gurshin, Carl Alfred,	Lynn,	35 North Prospect Street.
Hagelstein, Charles Henry, ¹	Dorchester,	4 North College.
Hallett, Charles Hiram, ¹	Mansfield,	Theta Chi.
Harlow, Frank Edward,	Malden,	77 Pleasant Street.
Harlow, Paul Goodhue,	Malden,	Phi Sigma Kappa.
Henderson, Elliott,	Boston,	7 South College.
Henninger, Roswell Woodward,	Williamsport, Pa.,	3 McClellan Street.
Higginbotham, Harry, ¹	Taunton,	North College.
Hill, Edmund Baldwin, ¹	Rutherford, N. J.,	Alpha Sigma Phi.
Holden, Richard Lynde,	Haverhill,	Lambda Chi Alpha.
Holder, Ralph Clifton,	South Braintree,	17 Kellogg Avenue.
Hubbell, Franklin Homer,	Westport, Conn.,	M. A. C. Farm House.
Hyde, Stanley Winship, ¹	Malden,	66 Pleasant Street.
Irving, William Raymond,	Taunton,	North College.
Jackson, Richmond Merrill, ¹	Georgetown,	Commons Club.
Kelsey, Edmund Dean, ¹	Amherst,	Commons Club.
Kelsey, Lincoln David,	West Hartford, Conn.,	Beta Kappa Phi.
Kinsman, Alfred Oberlin, Jr., ¹	Merrimac,	Lambda Chi Alpha.
Larson, Frederick Christian, ¹	Everett,	4 North College.
Latham, Paul Walker,	Norwichtown, Conn.,	Kappa Sigma.
Lawrence, Milford Robinson,	Falmouth,	Kappa Sigma.
Light, Brooks, ¹	Milton,	15 North College.
Livermore, William Tingley,	Lawrence,	83 Pleasant Street.
Loring, Albert Briggs,	Nantasket Beach,	Stockbridge Hall.
Lydiard, Harry Crowther, ¹	Hartford, Conn.,	3 Nutting Avenue.
Mack, Walter Adams,	Springfield,	8 North College.
MacLeod, Daniel Johnston, ¹	Wakefield,	Hillside Avenue.
Marchant, Horace Greenough, ¹	Cambridge,	5 Fearing Street.
Mather, Fred, ¹	Amherst,	Veterinary Laboratory.
Mayo, Frank Willard, ¹	Houlton, Me.,	Phi Sigma Kappa.
Mayo, William Irving, Jr.,	Framingham Center,	M. A. C. Farm House.
Merrill, Dana Otis, ¹	East Pepperell,	Commons Club.
Moorhouse, Newell,	Worcester,	5 South College.
Nash, Herman Beaman,	Amherst,	Amherst, R. F. D. No. 1.
Nelson, John Brockway, ¹	Newburyport,	Baker Place.
Noyes, Samuel Verne,	Georgetown,	Beta Kappa Phi.
Pierce, Harold Barnard,	Kansas City, Mo.,	80 Pleasant Street.
Pike, Chester Arthur, ¹	Smith's,	Mathematics Building.
Pratt, Harold Arthur,	Shrewsbury,	Lambda Chi Alpha.

¹ Work incomplete.

Quimby, Charles Frederick,	Cape Neddick, Me.,	83 Pleasant Street.
Randall, Earle MacNeill,	Winchester,	Lambda Chi Alpha.
Richardson, Lewis Elmer,	Rockville,	Lambda Chi Alpha.
Rodger, Raymond Miller,	Everett,	Beta Kappa Phi.
Rogers, Roland Winsor,	Braintree,	25 Lincoln Avenue.
Rorstrom, Hans Alfred,	Boston,	M. A. C. Farm House.
Ross, Louis Warren, ¹	Arlington,	Phi Sigma Kappa.
Saidel, Harry Samuel, ¹	Worcester,	3 Nutting Avenue.
Sargent, George Leonard, ¹	Merrimac,	17 Kellogg Avenue.
Saunders, William Putnam,	Lawrence,	116 Pleasant Street.
Sauter, John Martin, ¹	Turners Falls,	60 Pleasant Street.
Saville, William, Jr.,	Waban,	20 South College.
Schaefer, Leonard Charles, ¹	Holyoke,	Entomology Building.
Schwab, Andrew Nathan, ¹	Yalesville, Conn.,	Plant House.
Shumway, Paul Edward, ¹	Greenfield,	60 Pleasant Street.
Sims, James Stanley, ¹	Melrose,	Phi Sigma Kappa.
Smith, Herbert Dwight,	Northampton,	60 Pleasant Street.
Smith, Richard Woodworth,	Pittsfield,	Kappa Sigma.
Spaulding, Almon Whitney,	Dorchester,	16 South College.
Squires, Paul Revere, ¹	Belchertown,	Belchertown.
Stearns, Carlton McIntyre, ¹	Melrose,	120 Pleasant Street.
Stiles, Albert Ralph, ¹	Arlington Heights,	8 South College.
Stowell, Harold Thurber, ¹	Amherst,	193 South Pleasant Street.
Thayer, William Wallace,	Winter Hill,	Lambda Chi Alpha.
Tuthill, Samuel Fuller,	Mattapoisett,	M. A. C. Farm House.
Upson, Everett Langdon, ¹	New Britain, Conn.,	87 Pleasant Street.
Walbridge, Henry Blood,	Bennington, Vt.,	M. A. C. Farm House.
Warner, Merrill Pomeroy,	Sunderland,	5 South College.
Warren, Harold Manson, ¹	Melrose,	13 North College.
Warren, James Joseph,	North Brookfield,	Commons Club.
Webster, Frank Cedric,	Harvard,	Mathematics Building.
Westman, Robert Clayton,	Rosindale,	Baker Place.
Whitecomb, Warren Draper, ¹	Waltham,	Theta Chi.
Whitney, Joseph Fradley, ¹	Brooklyn, N. Y.,	Kappa Sigma.
Wilber, Charles Raymond,	Walpole,	French Hall.
Wilcox, Timothy Palmer,	Andover,	Alpha Sigma Phi.
Williams, Arthur Franklin, ¹	Sunderland,	6 South College.
Williams, Herbert Clifton, ¹	South Hadley Falls,	Whitney Street.

SOPHOMORE CLASS.

Additon, Elizabeth Emery,	Newton Center,	Draper Hall.
Allen, Amos Lawrence,	Dalton,	87 Pleasant Street.
Allen, Leland Christy, ¹	Holyoke,	120 Pleasant Street.
Allen, Ralph Emerson,	Everett,	Commons Club.
Babbitt, Frank Madison,	Fairhaven,	M. A. C. Farm House.
Bainbridge, Frank Benedict,	Paterson, N. J.,	6 South College.
Baker, Foster Kenneth,	Fairhaven,	Entomology Building.
Baker, Henry Raymond, ¹	Amherst,	West Street.
Barton, George Wendell,	North Sudbury,	36 North Prospect Street.
Bent, Winthrop Herbert, ¹	Watertown,	87 Pleasant Street.
Binks, Frank Joseph,	Maynard,	Beta Kappa Phi.
Boaz, William Henry, ¹	Covesville, Va.,	Phi Sigma Kappa.
Boyd, Robert Lucius, ¹	Lynn,	3 Nutting Avenue.
Brigham, Sylvia Bowen,	Newtonville,	Draper Hall.
Bruce, Walter Griffith,	Springfield,	21 Fearing Street.
Buchanan, Walter Gray, ¹	Chicopee,	97 Pleasant Street.
Buck, Rollin Hugh,	Worcester,	Beta Kappa Phi.
Burtch, Chester Swan,	New Bedford,	Theta Chi.
Calderwood, Herbert Hale, ¹	Rockport, Me.,	Kappa Sigma.
Canlett, Franklin Harwood,	Bedford,	36 North Prospect Street.
Capen, Howard Boyden, ¹	Canton,	Lambda Chi Alpha.

¹ Work incomplete.

Carlson, Fred Albert,	Pittsfield,	84 Pleasant Street.
Carter, Thomas Edward,	West Andover,	Lambda Chi Alpha.
Chamberlain, Sumner Fiske, ¹	Holden,	Commons Club.
Chambers, Roger James, ¹	Dorchester,	Alpha Sigma Phi.
Chapman, John Alden,	Salem,	10 Nutting Avenue.
Clapp, Roger Francis,	Salem,	79 Pleasant Street.
Clark, Stewart Sandy, ¹	Holyoke,	120 Pleasant Street.
Davis, Dwight Shaw,	Derry, N. H.,	66 Pleasant Street.
Dillon, Thomas Stevenson,	West Warren,	Aggie Inn.
Dowd, William Lawrence, ¹	North Amherst,	North Amherst.
Duncan, George James, ¹	Arlington,	3 Nutting Avenue.
Dunn, Arthur Paul, ¹	Malden,	29 McClellan Street.
Durfee, Norman Owen, ¹	Fall River,	Alpha Sigma Phi.
Edes, David Oliver Nourse, ¹	Bolton,	Lambda Chi Alpha.
Ellis, Ralph Chick, ¹	West Newton,	3 Nutting Avenue.
Emmerich, Louis Philip, ¹	Paterson, N. J.,	9 South College.
Erickson, George Edwin,	Brockton,	Lincoln Avenue.
Faber, Edward Stuart, ¹	Plainfield, N. J.,	Theta Chi.
Faneuf, Leo Joseph, ¹	West Warren,	Birch Lawn.
Farrar, Delwin Bruce, ¹	Amherst,	1 Dana Street.
Fellows, Harold Carter, ¹	Peabody,	Commons Club.
Ferriss, Samuel Boynton,	New Milford, Conn.,	Beta Kappa Phi.
Foley, William Albert,	Palmer,	35 North Prospect Street.
Foster, Hamilton Knight, ¹	New Rochelle, N. Y.,	24 Beston Street.
Foster, Roy Wentworth,	Lynn,	6 Nutting Avenue.
Francis, Donald Smith, ¹	Athol,	Beta Kappa Phi.
Fraser, Charles Allen, ¹	Plymouth,	Baker Place.
Frellick, Arthur Lester,	Everett,	13 Phillips Street.
Fuller, Camille Baldwin,	West Quincy,	Commons Club.
Garvey, Mary Ellen Monica,	Amherst,	27 South Prospect Street.
Gasser, Thomas Jefferson,	Uxbridge,	Lincoln Avenue.
Gifford, Flavel Mayhew,	West Tisbury,	Commons Club.
Gillette, Nathan Warner,	Revere,	5 South College.
Goodridge, George Lucien, ¹	Melrose,	Lambda Chi Alpha.
Goodwin, William Irving, ¹	Haverhill,	Lambda Chi Alpha.
Gordon, Frederick George,	Plymouth,	North Pleasant Street.
Gray, Milton Berford, ¹	Woods Hole,	13 Phillips Street.
Grayson, Forrest,	Milford,	Lincoln Avenue.
Haines, Foster Kingsley,	Peabody,	120 Pleasant Street.
Hance, Forrest Sansbury, ¹	Paterson, N. J.,	3 Nutting Avenue.
Harris, Warren Timothy, ¹	Millbury,	60 Pleasant Street.
Harwood, Ralph Wallace,	Barre,	Phi Sigma Kappa.
Hawley, Robert Dorman,	Springfield,	Phi Sigma Kappa.
Heffron, Paul John, ¹	Sherborn,	Birch Lawn.
Higgins, Leo Clement,	Amesbury,	Poultry Plant.
Holmes, George Frederick,	Ipswich,	30 North Prospect Street.
Holmes, Robert Palmer, ¹	Wakefield,	Kappa Sigma.
Howard, Arthur Merchant,	Pittsfield,	84 Pleasant Street.
Howe, Albert Edward, ¹	Needham,	Lincoln Avenue.
Howe, George Cole,	Worcester,	Lincoln Avenue.
Howes, Donald Francis,	Ashfield,	Birch Lawn.
Hunnewell, Paul Fiske, ¹	Winthrop,	13 Phillips Street.
Huntoon, Douglas Henderson,	Norwood,	13 Phillips Street.
Hurlburt, Ralph Walter,	Ashley Falls,	94 Pleasant Street.
Ingalls, Irving Weaver, ¹	Brooklyn, N. Y.,	Beta Kappa Phi.
Jackson, Charles Henry, ¹	Lexington,	Theta Chi.
Jepsky, Abraham,	East Boston,	North Amherst.
Johnson, Birger Lars,	Dorchester,	29 McClellan Street.
Johnson, Sidney Clarence, ¹	Gloucester,	13 Phillips Street.
Jones, Forrest Dean,	Worcester,	116 Pleasant Street.
Jones, Harold Ellis,	New Canaan, Conn.,	Care of E. F. Gaskill.
Kennedy, Carl Francis,	Milford,	23 Amity Street.

¹ Work incomplete.

Lanphear, Marshall Olin,	Windsor, Conn.,	Kappa Sigma.
Lasker, David, ¹	Hyde Park,	31 Pleasant Street.
Lawrence, Lewis Henry, ¹	Falmouth,	83 Pleasant Street.
Lawton, Ralph Wilber,	Fall River,	75 Pleasant Street.
Levine, Darwin Solomon, ¹	Sherborn,	31 Pleasant Street.
Lipshires, David Mathew,	Roxbury,	Flint Laboratory.
Loring, William Rupert,	Great Barrington,	Physics Building.
Lyons, Louis Martin,	Rockland,	29 North Prospect Street.
Maginnis, John Joseph, ¹	Lawrence,	35 North Prospect Street.
Mallorey, Alfred Sidney,	Lynn,	15 Hallock Street.
Marshall, Max Skidmore,	Amherst,	44 Sunset Avenue.
McKee, William Henry,	Chelsea,	Theta Chi.
McNamara, Michael Joseph, ¹	Stoughton,	Stockbridge Hall.
McNaught, Warren Henry, ¹	Plymouth,	Baker Place.
McRae, Herbert Ranklin, ¹	Malden,	4 Nutting Avenue.
Messenger, Kenneth Leroy,	Winsted, Conn.,	Kappa Sigma.
Millard, Harold Baldwin,	Great Barrington,	Fitts House.
Minor, John Bacon, Jr., ¹	New Britain, Conn.,	Kappa Sigma.
Mitchell, Edward Nahum, ¹	Medford,	Phi Sigma Kappa.
Mitchell, Theodore Bertis,	Needham,	Lambda Chi Alpha.
Mower, Carl Taft, ¹	Montpelier, Vt.,	Kappa Sigma.
Moynihn, Patrick Joseph, ¹	Holyoke,	Columbia Café.
Murrin, James Patrick, ¹	Dorchester,	Baker Place.
Newton, Edward Buckland, ¹	Holyoke,	120 Pleasant Street.
Newton, Gaylord Arthur,	Durham, Conn.,	3 Fearing Street.
Norcross, Gardner Clyde,	Brimfield,	58 Pleasant Street.
Odams, Lester Nichols, ¹	Salem,	83 Pleasant Street.
Oertel, August Leonard, ¹	South Hadley Falls,	Pleasant Street.
O'Heron, Francis James, ¹	East Milton,	5 Fearing Street.
O'Keefe, John Philip, ¹	Millers Falls,	60 Pleasant Street.
O'Neill, Oliver Maurice,	Dorchester,	29 McClellan Street.
Patch, Lawrence Henry,	Wenham,	Plant House.
Petit, Arthur Victor,	Amherst,	31 East Pleasant Street.
Phipps, Clarence Ritchie,	Dorchester,	Theta Chi.
Popp, Edward Williams,	Albany, N. Y.,	3 McClellan Street.
Powell, James Congdon,	Newport, R. I.,	20 South College.
Pratt, Oliver Goodell,	Salem,	Kappa Sigma.
Preble, John Nelson,	Jamaica Plain,	116 Pleasant Street.
Raymond, Clinton Rufus,	Beverly,	Lambda Chi Alpha.
Reumann, Theodore Henry,	New Bedford,	87 Pleasant Street.
Richardson, Stephen Morse,	Montague,	9 South College.
Ritter, Ernest, ¹	New Britain, Conn.,	Theta Chi.
Robbins, Waldo Whiting, ¹	South Hingham,	53 Lincoln Avenue.
Roberts, Oliver Cousins,	Roxbury,	Theta Chi.
Robinson, William Herbert,	Lynn,	87 Pleasant Street.
Rosequist, Birger Reingnold, ¹	Brockton,	18 Nutting Avenue.
Russell, Howard Leigh,	Worcester,	116 Pleasant Street.
Rutter, Walter Frederick,	Lawrence,	17 Fearing Street.
St. George, Raymond Alexander, ¹	Lynn,	15 Hallock Street.
Sampson, Fred Bucknam, ¹	Fall River,	60 Pleasant Street.
Sanborn, Deane Waldron,	Nantucket,	North Pleasant Street.
Sawyer, Wesley Stevens, ¹	Jamaica Plain,	Beta Kappa Phi.
Sawyer, William George,	Berlin,	7 South College.
Schlough, George Homer, ¹	Waltham,	6 Nutting Avenue.
Schwartz, Louis, ¹	Melrose,	West Experiment Station.
Seavey, Arthur Jones, ¹	New Braintree,	Theta Chi.
Sedgwick, Alfred, ¹	Fall River,	Alpha Sigma Phi.
Smith, Carleton Tower,	West Newton,	116 Pleasant Street.
Smith, Sidney Sumner,	Roslindale,	116 Pleasant Street.
Spaulding, Lewis Winans, ¹	South Hingham,	8 South College.
Spencer, Arthur Winthrop, ¹	Danvers,	North College.
Stackpole, Frank Charles, ¹	Somerville,	Lambda Chi Alpha.

Stowe, Raymond Timothy, . . .	Scitico, Conn., . . .	15 Hallock Street.
Stowers, Addison Clifford, . . .	Dorchester, . . .	15 Phillips Street.
Strong, William Perkins, ¹ . . .	South Hadley Falls, . . .	Pine Street, North Amherst.
Sullivan, Harold Leo, . . .	Lawrence, . . .	7 North College.
Sutherland, Ralph, . . .	Cambridge, . . .	Alpha Sigma Phi.
Thompson, Wells Nash, ¹ . . .	Adams, . . .	Alpha Sigma Phi.
Thorpe, Richard Warren, . . .	West Medford, . . .	15 Beston Street.
Tilton, Arthur Dana, ¹ . . .	Wellesley, . . .	Phi Sigma Kappa.
vanAlstyne, Lewis Morrell, ¹ . . .	Kinderhook, N. Y., . . .	Baker Place.
Vickers, John, ¹ . . .	Amherst, . . .	Beta Kappa Phi.
Walker, George Jones, ² . . .	Lexington, . . .	—
Weeks, Roger Wolcott, . . .	Hyde Park, . . .	Kappa Sigma.
Wilbur, Laurence Weston, . . .	South Middleborough, . . .	Beta Kappa Phi.
Willoughby, Raymond Royce, . . .	New Britain, Conn., . . .	Care of E. F. Gaskill.
Wooding, Paul Bennett, ¹ . . .	Yalesville, Conn., . . .	M. A. C. Plant House.
Woodworth, Brooks, . . .	Lowell, . . .	Lincoln Avenue.
Worthley, Harlan Noyes, . . .	Greenwood, . . .	Flint Laboratory.
Yesair, John, ¹ . . .	Byfield, . . .	Kappa Sigma.

FRESHMAN CLASS.

Abrams, Jacob, ¹ . . .	East Boston, . . .	North Amherst.
Alden, Dean Watson, ¹ . . .	Proctor, Vt., . . .	North Amherst.
Anderson, George, ¹ . . .	Somerville, . . .	15 Beston Street.
Andrews, Milton Earle, . . .	Hammonton, N. J., . . .	30 North Prospect Street.
Bailey, William, ¹ . . .	Williamstown, . . .	North Amherst.
Baker, William Alphonso, ¹ . . .	Melrose, . . .	66 Pleasant Street.
Baker, William Herbert, Jr., . . .	Chesterfield, . . .	5 Nutting Avenue.
Bartlett, Samuel Colcord, Jr., . . .	Colerain, . . .	81 Pleasant Street.
Batchelder, Stewart Putnam, . . .	North Reading, . . .	66 Pleasant Street.
Bath, Richard George, . . .	West Springfield, . . .	5 McClellan Street.
Batista, Victor, . . .	Havana, Cuba, . . .	79 Pleasant Street.
Beadle, Herbert Ocumpaugh, . . .	Lima, N. Y., . . .	18 Nutting Avenue.
Bigelow, George Samuel, ¹ . . .	Millville, N. J., . . .	Lincoln Avenue.
Blanchard, Carlton Douglas, . . .	Uxbridge, . . .	9 Phillips Street.
Blanchard, George Kinson, . . .	Abington, . . .	Baker Place.
Boland, Kells Shepard, . . .	South Boston, . . .	9 Fearing Street.
Bond, Herbert Richard, . . .	Dover, . . .	Lincoln Avenue.
Bowen, Arthur Newton, ¹ . . .	Wollaston, . . .	15 Phillips Street.
Bowen, Maurice Stetson, ¹ . . .	Lakeville, . . .	81 Pleasant Street.
Bower, Richard, ¹ . . .	Braintree, . . .	Baker Place.
Boyce, Alan Freeman, ¹ . . .	Melrose, . . .	Baker Place.
Boynnton, Raymond Woods, ¹ . . .	Framingham, . . .	120 Pleasant Street.
Brigham, Paul Tracy, . . .	Leominster, . . .	77 Pleasant Street.
Brown, Ralph Hall, . . .	Ayer, . . .	17 Phillips Street.
Buffum, Eliot Mansfield, . . .	Waban, . . .	77 Pleasant Street.
Burt, Henry John, . . .	West Somerville, . . .	75 Pleasant Street.
Burton, Lee Williams, . . .	Plainville, . . .	58 Pleasant Street.
Callanan, John Edward, . . .	Dorchester, . . .	60 Pleasant Street.
Callanan, Vincent DePaul, . . .	Malden, . . .	4 Chestnut Street.
Campbell, Donald Lincoln, ¹ . . .	South Deerfield, . . .	66 Pleasant Street.
Campbell, George Murray, ¹ . . .	Baltimore, Md., . . .	Mount Pleasant.
Carley, Harry Gray, ¹ . . .	West Newton, . . .	Lincoln Avenue.
Carpenter, Hall Bryant, ¹ . . .	Somerville, . . .	14 Nutting Avenue.
Carroll, Olive Evangeline, ¹ . . .	Dorchester, . . .	Draper Hall.
Cassidy, Morton Harding, . . .	East Boston, . . .	3 McClellan Street.
Chadbourne, Joseph Alfred, . . .	Great Barrington, . . .	87 Pleasant Street.
Chandler, Arthur Lincoln, . . .	Leominster, . . .	77 Pleasant Street.
Chapin, Frederic Charles, . . .	Greenfield, . . .	15 Beston Street.
Chase, Chester Ingalls, ¹ . . .	Melrose, . . .	17 Phillips Street.
Chase, Malcolm Willis, . . .	Amesbury, . . .	4 Chestnut Street.
Chisholm, Robert Dudley, . . .	Melrose Highlands, . . .	66 Pleasant Street.

¹ Work incomplete.² Entered in February, 1915; left in June, 1915.

Clapp, Augustus Warren,	East Braintree,	Baker Place.
Clark, Francis Marsh,	Oxford,	1 Allen Street.
Coderre, Ernest Laurier,	Southbridge,	35 North Prospect Street.
Coe, Elmore Holloway, ¹	Rockfall, Conn.,	16 Nutting Avenue.
Cole, Frederick Eugene, Jr.,	South Portland, Me.,	North Amherst.
Collins, Robert Burleigh,	Rockland,	116 Pleasant Street.
Cone, Willis Refine, ¹	Mittineague,	5 McClellan Street.
Cooley, Edwin Prince,	Sunderland,	Sunderland Road.
Copeland, Raymond Norman, ¹	Hyde Park,	44 Pleasant Street.
Cosby, Alfred Francis,	Westfield,	15 Amity Street.
Crawford, Aaron Ennis,	Greenfield,	60 Pleasant Street.
Crimmin, Royce Brainerd,	Haverhill,	7 Nutting Avenue.
Crowe, Charles,	Norwich, Conn.,	Baker Place.
Davies, James Pillsbury, ¹	Cambridge,	6 Phillips Street.
Day, Elston Almond,	Northbridge,	58 Pleasant Street.
Day, Harold Ralph, ¹	Hopedale,	Baker Place.
Desmond, Thomas Whitty, ¹	Randolph,	Baker Place.
Dickinson, Victor Abel, ¹	Amherst,	Mount Pleasant.
Donigan, Henry Joseph,	Marion,	North Amherst.
Douglas, Effie Pearl, ¹	Amherst,	High Street.
Dunbar, Charles Oliver,	Westfield,	7 Allen Street.
Dunn, Leslie Burnham, ¹	Melrose Highlands,	5 Nutting Avenue.
Dwyer, James Edward,	South Deerfield,	17 Phillips Street.
Edmonds, Reginald Whitney,	Roslindale,	37 North Prospect Street.
Eilertsen, Arthur Oliver, ¹	Roslindale,	116 Pleasant Street.
Erhard, Bena Gertrude, ¹	East Milton,	Draper Hall.
Erickson, Gunnar Emmanuel,	Lynn,	North Amherst.
Evans, Myrton Files,	West Somerville,	14 Nutting Avenue.
Faneuf, Ambrose Clement,	West Warren,	Birch Lawn.
Farrington, Robert Pierce, ¹	Nantucket,	Birch Lawn.
Faxon, Paul,	West Newton,	77 Pleasant Street.
Fellows, Katharine Adelheid,	Northampton,	21 Amity Street.
Field, John Bacon, ¹	Sharon,	4 Chestnut Street.
Field, Wilbert Daniel, ¹	Somerville,	6 Nutting Avenue.
Finkelstein, Hyman,	East Boston,	-
Fiske, Eustace Bridge,	Somerville,	75 Pleasant Street.
Fogg, Verne Allen, ¹	Topsfield,	4 Chestnut Street.
French, Willard Kyte,	Worcester,	6 Phillips Street.
Garde, Earl Augustus,	Lynn,	Pease Avenue.
Gay, Laurence Washburn,	Groton,	116 Pleasant Street.
Gilligan, Gerald Mathew, ¹	West Warren,	12 South Prospect Street.
Glavin, William Francis,	Wenham,	6 Phillips Street.
Goff, Howard Mason,	Everett,	120 Pleasant Street.
Graves, Walter Decker, ¹	Brookline,	Baker Place.
Gray, Harold Frederick,	Townsend Harbor,	5 Nutting Avenue.
Green, Lynn,	Schenevus, N. Y.,	75 Pleasant Street.
Grout, Nathan, ¹	Sherborn,	60 Pleasant Street.
Guba, Emil Frederick, ¹	New Bedford,	12 Cottage Street.
Gurshin, Melvin William,	Lynn,	35 North Prospect Street.
Hall, Frank Edwin, ¹	Rockland,	Aggie Inn.
Hamilton, Howard Milton, ¹	Winchester,	Cottage Street.
Harding, George Warren, ¹	Somerville,	14 Nutting Avenue.
Harris, Ethel Lovett, ¹	Beverly,	Draper Hall.
Hartwell, Richard Raymond,	Springfield,	Baker Place.
Haslam, Emerson Francis,	Hyde Park,	3 Nutting Avenue.
Hastings, Louis Pease,	Springfield,	Baker Place.
Hathaway, Wilfred Adelbert,	Berkley,	44 Triangle Street.
Hayes, John Anthony,	Milford,	Mount Pleasant.
Hession, William Joseph,	Somerville,	14 Nutting Avenue.
Hodgson, Benjamin Earl,	Methuen,	22 Amity Street.
Holmgren, Richard Sigfrid,	East Lynn,	15 Hallock Street.
Hopkins, George Randolph Lawrence, ¹	Orleans,	60 Pleasant Street.

¹ Work incomplete.

Howe, Ralph Thomas, . . .	Melrose Highlands, . . .	5 Nutting Avenue.
Howland, George Herbert, ¹ . . .	Melrose Highlands, . . .	83 Pleasant Street.
Jewell, Charles Henry, . . .	Merrimac, . . .	17 Kellogg Avenue.
Johnson, Lawrence Wilhelm, . . .	Avon, . . .	12 Cottage Street.
Jones, Edson Temple, ¹ . . .	Roslindale, . . .	42 McClellan Street.
Jordan, Raymond Douglas, ¹ . . .	Springfield, . . .	21 Fearing Street.
Kelley, Kenneth Gordon, . . .	Lynn, . . .	—
Kennedy, Alan Giles, ¹ . . .	Milford, . . .	21 Amity Street.
King, William Cutting, ¹ . . .	Suffield, Conn., . . .	5 Sunset Avenue.
Knight, Frank Edward, . . .	Brimfield, . . .	58 Pleasant Street.
Kolpack, Harry William, . . .	East Boston, . . .	North Amherst.
Leavitt, John Woodbury, . . .	Dorchester, . . .	18 Nutting Avenue.
Liebman, Anna, ¹ . . .	Dorchester, . . .	38 Cottage Street.
Lochiades, Charilaos George, ¹ . . .	Springfield, . . .	67 Pleasant Street.
Logan, Milan Alexander, ¹ . . .	Brockton, . . .	North Amherst.
Macdonald, Harold Ray, . . .	Buzzards Bay, . . .	6 Phillips Street.
Mahon, John Joseph, . . .	New Canaan, Conn., . . .	Baker Place.
Mansell, Elton Jessup, . . .	Cambridge, . . .	15 Beston Street.
Martin, Chester Walter, ¹ . . .	Orange, . . .	Baker Place.
Mattoon, Charles Gordon, . . .	Pittsfield, . . .	120 Pleasant Street.
McCarthy, Arthur Martin, ¹ . . .	Monson, . . .	East Pleasant Street.
McGivern, Eugene Augustine, . . .	Lynn, . . .	44 Triangle Street.
Montgomery, Arthur Bird, . . .	Dedham, . . .	44 Pleasant Street.
Montgomery, Forest Kimball, . . .	East Orange, N. J., . . .	Baker Place.
Moor, Erwin Charles, . . .	Lynn, . . .	7 Allen Street.
Moore, John Raymond, . . .	Tolland, . . .	Birch Lawn.
Morgan, Earl Amos, . . .	Amherst, . . .	2 Allen Street.
Morse, Louis Edgar, Jr., . . .	North Attleborough, . . .	101 Pleasant Street.
Morton, Elmer Joshua, ¹ . . .	Waltham, . . .	4 Chestnut Street.
Moskowitz, Maurice, . . .	Dorchester, . . .	31 Pleasant Street.
Munroe, Raymond Franklin, . . .	Fall River, . . .	77 Pleasant Street.
Newbold, Douglas Tracy, . . .	Northampton, . . .	Lincoln Avenue.
Newton, Raymond Lovejoy, ¹ . . .	Malden, . . .	15 Fearing Street.
O'Hara, Joseph Ernest, ¹ . . .	Worcester, . . .	6 Phillips Street.
Parke, Robert Warren, . . .	Winchendon, . . .	7 Allen Street.
Parkhurst, Raymond Thurston, . . .	Fitchburg, . . .	53 Lincoln Avenue.
Parsons, Edward Field, . . .	North Amherst, . . .	North Amherst.
Peck, George Newberry, ¹ . . .	Wilson, Conn., . . .	75 Pleasant Street.
Peck, Roger Eugene, . . .	Shelburne, . . .	5 McClellan Street.
Peirson, Henry Byron, . . .	Haverhill, . . .	7 Nutting Avenue.
Perry, Errol Clinton, ¹ . . .	Acushnet, . . .	15 Hallock Street.
Peterson, Leroy Duane, . . .	Greenfield, . . .	44 Triangle Street.
Phemister, Robert Grey, . . .	Providence, R. I., . . .	15 Phillips Street.
Pierpont, Frederick Trowbridge, . . .	Chester, Pa., . . .	7 Nutting Avenue.
Platt, William Sherman, . . .	Leominster, . . .	7 Nutting Avenue.
Pond, Allan Leon, . . .	Holliston, . . .	15 Phillips Street.
Poole, Harold Walter, . . .	Hudson, . . .	96 Pleasant Street.
Prée, Karl Julius, . . .	Brookline, . . .	81 Pleasant Street.
Pulley, Marion Gertrude, . . .	Melrose, . . .	2 Allen Street.
Quimby, Arthur Edmund, . . .	Somerville, . . .	36 North Prospect Street.
Rea, Julian Stuart, ¹ . . .	Weymouth, . . .	Lincoln Avenue.
Readio, Roger Frank, . . .	Florence, . . .	120 Pleasant Street.
Rice, Harold Miller, . . .	Kensington, Conn., . . .	3 McClellan Street.
Roberts, Mark Anthony, ¹ . . .	Dorchester, . . .	17 Phillips Street.
Ross, Donald, . . .	Arlington, . . .	15 Beston Street.
Rowe, Clifford Alton, ¹ . . .	East Orange, N. J., . . .	81 Pleasant Street.
Sampson, George Austin, ¹ . . .	Allston, . . .	15 Phillips Street.
Sargent, Walter Harriman, . . .	Malden, . . .	4 Chestnut Street.
Schenkelberger, Frederic, ¹ . . .	Quincy, . . .	Aggie Inn.
Seavey, Paul Stanley, ¹ . . .	Cambridge, . . .	17 Fearing Street.
Sexton, Ernest Francis, . . .	Darien, Conn., . . .	Baker Place.
Sheldon, Howard Rhoades, . . .	New Marlborough, . . .	4 Chestnut Street.

¹ Work incomplete.

Sibley, Helen Aramintha, . . .	Longmeadow, . . .	Draper Hall.
Skinner, Everett Hamilton, ¹ . . .	West Upton, . . .	Baker Place.
Smallwood, John Henry, . . .	Paterson, N. J., . . .	3 Nutting Avenue.
Smith, Jonathan Harold, . . .	Roslindale, . . .	116 Pleasant Street.
Smith, Wendell Frederick, ¹ . . .	Troy, N. Y., . . .	75 Pleasant Street.
Snow, Palmer Prince, . . .	Barnstable, . . .	North Amherst.
Spaulding, Harold Edwin, ¹ . . .	Milford, . . .	Baker Place.
Sproul, Walton Dyer, . . .	Norwell, . . .	29 North Prospect Street.
Stafford, Irving Boynton, . . .	Fall River, . . .	75 Pleasant Street.
Stearns, Horace David, . . .	Waltham, . . .	3 McClellan Street.
Stevens, Chester Dillingham, . . .	Reading, . . .	66 Pleasant Street.
Stockbridge, John Sylvester, . . .	Atlanta, Ga., . . .	Farview Way.
Stockwell, Erwin Sidney, Jr., . . .	Sharon, . . .	81 Pleasant Street.
Strack, Edward, . . .	Framingham, . . .	Clark Hall.
Stuart, Vincent Cyril, . . .	Newton, . . .	Aggie Inn.
Sweeney, William Joseph, ¹ . . .	Dorchester, . . .	Hillside Avenue.
Swift, Hubbard, . . .	West Falmouth, . . .	10 South College.
Taylor, Edmund Billings, ¹ . . .	Wollaston, . . .	81 Pleasant Street.
Thayer, Julian Bailey, . . .	Durham Center, Conn., . . .	36 North Prospect Street.
Thayer, Weston Cushing, . . .	Hingham, . . .	53 Lincoln Avenue.
Thomas, Daniel Joseph, ¹ . . .	Turners Falls, . . .	36 North Prospect Street.
Thomas, Frank DesAutel, ¹ . . .	Milford, . . .	Mount Pleasant.
Tietz, Harrison, . . .	Richmond Hill, N. Y., . . .	Brooks Farm.
Tirrell, Loring Vinson, ¹ . . .	South Weymouth, . . .	16 Nutting Avenue.
Waite, Richard Austin, . . .	Middlefield, . . .	17 Phillips Street.
Wells, Marion Nichols, . . .	Springfield, . . .	Draper Hall.
Wheeler, Russell Hubbell, . . .	Newtown, Conn., . . .	M. A. C. Farm House.
White, Edward Asa, . . .	Providence, R. I., . . .	North Pleasant Street.
White, George Lansford, ¹ . . .	Great Barrington, . . .	87 Pleasant Street.
Whittle, Clarence Parker, Jr., . . .	Weymouth, . . .	16 Nutting Avenue.
Wilder, Charles Henry, . . .	Springfield, . . .	21 Fearing Street.
Williams, Allan Carruth, . . .	Rockland, . . .	29 North Prospect Street.
Williams, Kenneth Sanderson, . . .	Sunderland, . . .	17 Phillips Street.
Willis, Howard Curtis, ¹ . . .	Amherst, . . .	13 Cottage Street.
Window, James Joseph, . . .	Lynn, . . .	7 Allen Street.
Window, Thomas, ¹ . . .	Lynn, . . .	7 Allen Street.
Wing, Arland Junius, . . .	Danvers, . . .	12 Cottage Street.
Wiswell, Ray Herbert, . . .	Northampton, . . .	66 Pleasant Street.
Wood, Ernest Perry, . . .	Mendon, . . .	7 Phillips Street.
Wood, Oliver Wiswell, . . .	Arlington, . . .	81 Pleasant Street.
Woodard, Chester Smith, . . .	Leverett, . . .	Leverett.
Woodbury, Ray Willard, . . .	Newburyport, . . .	Cottage Street.
Woods, Frank Archibald, . . .	Groton, . . .	83 Pleasant Street.
Woodside, Wilfred Livingstone, ¹ . . .	Auburndale, . . .	4 Chestnut Street.
Wright, John Lindsey, ¹ . . .	Putnam, Conn., . . .	Kappa Sigma.
Wright, Livingstone, ¹ . . .	Quincy, . . .	4 Chestnut Street.

UNCLASSIFIED STUDENTS.

Allen, Arthur Frederic, . . .	Cambridge, . . .	Prospect House.
Avery, Humphrey Roger, . . .	Patchogue, N. Y., . . .	77 Pleasant Street.
Berry, Fred Mitchell, . . .	Lynnfield Center, . . .	120 Pleasant Street.
Bridgman, Ralph Scofield, . . .	Westhampton, . . .	60 Pleasant Street.
Campbell, John Collins, . . .	Gardner, . . .	Baker Place.
Churchill, Chester Albert, . . .	Brockton, . . .	18 Nutting Avenue.
Clancy, Henry Gregory, . . .	Natick, . . .	Baker Place.
Crane, Arthur Francis, . . .	North Hanover, . . .	24 Beston Street.
Cross, Robert Earle, . . .	Agawam, . . .	21 Fearing Street.
Derby, Llewellyn Light, ¹ . . .	Hudson, . . .	Baker Place.
Emerson, Caroline Dwight, . . .	Amherst, . . .	21 Northampton Road.
Gamage, Carl Everett, . . .	Lynn, . . .	-
Grundler, Adolph Joseph, . . .	Lowell, . . .	120 Pleasant Street.

¹ Work incomplete.

Gustafson, Helmar Gustaf,	Springfield,	18 Hallock Street.
Hill, Donald Russell,	Arlington,	29 McClellan Street.
Jones, Percival,	Cambridge,	Mount Pleasant.
Kidder, Addison Richard,	Wardsboro, Vt.,	3 McClure Street.
Leary, Frank Dennis,	Brockton,	12 Cottage Street.
McLean, George Robert, ¹	Northampton,	60 Washington Avenue, Northampton.
McManus, Mark Augustine,	Lawrence,	101 Pleasant Street.
Morse, Louis Lincoln,	Dorchester,	7 Allen Street.
Norris, Harold Allison,	Amherst,	North Amherst.
Phillips, Everett Daniel,	Brookline,	101 Pleasant Street.
Spaulding, Lyford Pingree,	Lexington,	77 Pleasant Street.
Stebbins, Blanchard,	Newton,	— —

SUMMARY BY CLASSES.

Graduate students,	52
Senior class,	108
Junior class,	110
Sophomore class,	162
Freshman class,	211
Unclassified students,	25
Total registration,	668

GEOGRAPHICAL SUMMARY.

Massachusetts,	564
Connecticut,	30
New York,	21
New Jersey,	14
Pennsylvania,	6
Maine,	5
Vermont,	5
Rhode Island,	4
New Hampshire,	3
Canada,	2
California,	1
Cuba,	1
Georgia,	1
India,	1
Indiana,	1
Japan,	1
Kansas,	1
Maryland,	1
Missouri,	1
Ohio,	1
Oklahoma,	1
Oregon,	1
Virginia,	1
Wyoming,	1
Total,	668

¹ Work incomplete.

SHORT COURSE STUDENTS, 1915.

THE TEN WEEKS' COURSE.

Adams, Chas. J.,	Arlington.
Aldrich, Leon H.,	Northampton.
Allen, E. B.,	Stockbridge.
Anderson, Mrs. Ernest,	Amherst.
Atkins, Horace K.,	Pleasant Lake.
Bacon, Ralph D.,	Auburn.
Baker, Philip E.,	Norwood.
Barker, Arthur R.,	Littleton.
Barnes, Blakeslee H.,	Yalesville, Conn.
Barnes, James P.,	Yalesville, Conn.
Bates, Fred A.,	Huntington.
Bates, Stacy C.,	Concord Junction.
Bemis, Roger E.,	Spencer.
Bowles, Howard J.,	Springfield.
Bradshaw, Forrest D.,	South Framingham.
Bridgman, Federal B.,	Westhampton.
Briggs, Harry G.,	Beverly.
Briggs, Leslie W.,	Fitchburg.
Brooks, George R.,	North Grafton.
Brooks, Ida L.,	Worcester.
Brooks, Roger E.,	Worcester.
Buckland, Frederick,	Watertown.
Buckley, W. A.,	Townsend Harbor.
Carr, Ralph W.,	Ashby.
Chapman, E. A.,	Montgomery.
Childs, Stewart I.,	Sunderland.
Clark, Ernest S., Jr.,	Sutton.
Clark, Leonard T.,	Wethersfield, Conn.
Clark, Roderick A.,	Florence.
Clark, William Hobart,	Danvers.
Clary, J. A.,	Conway.
Clem, Katharine L.,	Brooklyn, N. Y.
Colitas, George,	Waltham.
Comstock, Clark P.,	Housatonic.
Coristine, Mrs. Mary S.,	Lee.
Coristine, Walter,	Lee.
Corson, Earl L.,	Okeana, O.
Cox, Fannie A.,	Hyde Park.
Dalrymple, George S.,	Plainfield.
Dana, Alfred L.,	Great Neck, Long Island, N. Y.
Davison, L. B.,	Danby, Vt.
Demirjian, Moses N.,	Bridgewater.
Dorling, Herbert,	Spencer.
Dorsey, John E., Jr.,	North Amherst.
Downs, Winnifred D.,	Springfield.
Dragon, Frank W.,	Northampton.
Drummond, Joseph L.,	Amherst.
Ebersbach, Fador,	Lawrence.
Edwards, Harold,	Dunham, Province of Quebec, Can.
Eldred, George E.,	Bennington, Vt.

Ellis, Charles H.,	Boston.
Ely, Ralph A.,	Holyoke.
Fargo, Frank,	Conway.
Flagg, Maurice,	Littleton Common.
Gala, Andrew,	Greenwich, Conn.
Galligan, Clarence,	New Haven, Conn.
Gardner, Shirley E.,	Pittsfield.
Garrett, Jackson R.,	Concord.
Gaylord, F. B.,	Northampton.
Gee, Harold W.,	Springfield.
Gee, Mrs. Harold W.,	Springfield.
Goff, Henry H.,	Fall River.
Goff, Winslow H.,	Grafton.
Gushee, Almond E.,	Dorchester.
Hall, Louis C.,	Wallingford, Conn.
Hallberg, Carl A.,	Peabody.
Hames, Lawrence B.,	Springfield.
Hamlin, Benj. P.,	Amherst.
Hamlin, Margaret R. P.,	Amherst.
Hammond, Burton N.,	Onset.
Hammond, Charles W.,	Rossville, N. Y.
Hancock, Mrs. Alice H.,	Hyde Park.
Hanley, James F.,	Concord.
Harmount, Dwight Hunt,	Branford, Conn.
Harrington, Ellis T.,	Paxton.
Hopkinson, Harry B.,	Cambridge.
Hubbard, D. B., Jr.,	Middletown, Conn.
Jaspers, Richard,	New Haven, Conn.
Johnson, George L., Jr.,	Pittsfield.
Johnson, Walter C.,	Springfield.
Jones, Mrs. E. A.,	Honolulu, Hawaii.
Kennedy, Florence E.,	New Haven, Conn.
Kennedy, Marguerite I.,	New Haven, Conn.
Keyes, F. G.,	Worcester.
Kimball, Elizabeth,	Arlington.
King, Arthur E.,	Sutton.
Kingman, Robert W.,	Somerville.
Lancy, Benj. C.,	Halifax.
Law, W. P., Jr.,	Lynnfield.
Lee, Margaret D.,	Northampton.
Leonard, William J.,	Ashuelot, N. H.
Levenson, Samuel,	Holyoke.
Livers, Susie D.,	Arlington Heights.
Luther, C. Raymond,	Millbury.
Lyman, Clarence S.,	Gilbertville.
Lyman, F. Brainard,	Grafton.
McConnell, Ralph,	Somerville.
McCray, Carlos,	Monson.
MacDonald, Wm. H.,	Forest Hills.
McKinstry, Joseph H.,	Auburn.
McKirahan, J. E.,	East Ryegate, Vt.
MacLeod, Roderick A.,	Northampton.
Mace, Albert E.,	Wilbraham.
Manning, Charles H.,	Pittsfield.
Marsh, John E.,	Melrose Highlands.
Mathews, L. R.,	Springfield.
Maxwell, Harry,	Elmwood, N. H.
Miller, Donald H.,	Whitman.
Mills, Chester A.,	Pepperell.
Minigan, Everett H.,	Sterling Junction.
Mitchell, Robert A.,	Danvers.
Montgomery, G. Milton, Jr.,	Windsor Locks, Conn.
Moore, Elizabeth F.,	Washington, D. C.
Mosher, Jay M.,	North Attleborough.

Mosher, Samuel M.,	Lakeville.
Nason, Charles A.,	Boston.
Newton, R. L.,	Malden.
Nims, Roger E.,	Montague.
Northrop, Marvin E.,	Three-Mile Bay, N. Y.
Noyes, Walter O.,	Newburyport.
Ogawa, Wasaburo,	Milton.
Ohlson, Carl,	Pittsfield.
Oliver, Wendell F.,	Lynn.
Osgood, John B.,	Orange.
Osgood, Mrs. John B.,	Orange.
O'Toole, Patrick B.,	Waltham.
Owen, Elmer G.,	Paxton.
Parker, Ervine F.,	Poquonock.
Parker, George E.,	East Lynn.
Parsons, Earl M.,	Northampton.
Peck, Fred S.,	South Dayton, N. Y.
Perry, Norman,	Sutton.
Pierce, Harry W.,	Amherst.
Potter, Edward K.,	New Haven, Conn.
Poulin, Alexander, Jr.,	South Lancaster.
Pratt, Walter H.,	Dalton.
Priest, Mrs. Lucia M.,	Allston.
Prior, Leon C.,	Plympton.
Prouty, Ellis F.,	Amherst.
Randall, Alvin R.,	Agawam.
Rhodes, George,	Canaan, Conn.
Richardson, Leroy M.,	Winchester.
Roberts, Ivan A.,	South Lee.
Robinson, John,	Oakham.
Rogers, Helen,	Rochester.
Russell, Edward S.,	Amherst.
Russell, Perley E.,	St. Johnsbury, Vt.
Sanborn, Arthur H.,	Winter Hill.
Sanborn, Ruby,	Beverly.
Schweitzer, Walter,	Jamaica Plain.
Scotfield, Ralsey B.,	Greenwich, Conn.
Senter, Everett E.,	Clinton.
Shattuck, George A.,	East Pepperell.
Skinner, Russell,	Brimfield.
Smith, Harry A.,	Bolton.
Smith, Harry A.,	Amherst.
Smith, Walter B.,	West Chesterfield.
Stark, Joseph F.,	West Brattleboro, Vt.
Stickney, F. H.,	Worcester.
Stocking, Charles P.,	Williamstown.
Stockwell, Wm. T.,	Sutton.
Stone, Frederick T.,	Chelsea.
Stone, Robert D.,	Worthington.
Stoughton, Philip,	Montague.
Stowell, A. L.,	Springfield.
Thomas, O. D.,	Brockton.
Tower, Harold M.,	Becket.
True, Fred L.,	Salisbury.
Trumbull, Lymont A.,	Worcester.
Tucker, Henry G.,	Avon.
Tucker, Mrs. Ruth B.,	Avon.
Tufts, James Arthur, Jr.,	Concord.
Turoff, Henry,	Attleboro.
Walpuski, Theodore G., Jr.,	New York City.
Warland, W. S.,	Cambridge.
White, Donald,	Wakefield.
White, Gertrude M.,	Hartford, Conn.
White, Henrique R. F.,	New York City.

Willard, Harold N.,	Roland Park, Md.
Williams, Raymond F.,	Holyoke.
Willis, Nelson B.,	Upton.
Wilson, William A.,	South Hadley.

SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE.

Adams, Ruth A.,	Worcester.
Allanbrook, Mabel C.,	Wilmington.
Armstrong, Mary F.,	West Springfield.
Arnold, John B.,	Tarrytown, N. Y.
Arnold, Mrs. John B.,	Tarrytown, N. Y.
Ayer, Addie M.,	Richford, Vt.
Bailey, Laura H.,	East Saugus.
Bales, Mrs. Harold C.,	North Amherst.
Bau, Mingchie J.,	China.
Bauman, Lucian,	Holyoke.
Bellamy, Mrs. John,	Dorchester.
Bernhardt, Laura,	Harvard.
Beytes, Marion W.,	North Plymouth.
Bleeker, Alethea S.,	Methuen.
Bottume, Hazel E.,	Windsor Locks, Conn.
Brewer, Cyrus,	Scituate.
Brewer, Mrs. Cyrus,	Scituate.
Broad, Gertrude F.,	Gloucester.
Bryant, Bertha W.,	Woburn.
Buckley, Ethel L.,	Needham.
Burk, Emma L.,	Philadelphia, Pa.
Burnap, Margaret,	Woburn.
Burt, Helen F.,	West Somerville.
Carlisle, Edward S.,	Malden.
Carlton, Louise E.,	Williamstown.
Carver, Katharine H.,	Meriden, Conn.
Cassini, Mrs. E.,	Boston.
Chapin, Jennie E.,	Richmond Hill, N. Y.
Cheiffets, Louia,	Worcester.
Chen, H. C.,	Baltimore, Md.
Clark, Frank Y.,	Newton Center.
Clark, W. B.,	Williamstown.
Clarkson, Margaret M.,	Fall River.
Cotton, Edith F.,	Malden.
Cummings, Mary F.,	Boston.
Davis, Ruth A.,	Winter Hill.
Day, Mrs. Clara S.,	New York City.
Demond, Grace E.,	Chicopee Falls.
Denslow, Raymond A.,	Berwyn, Ill.
Doran, Cecilia M.,	Fall River.
Dresser, Henrietta M.,	Haverhill.
Dudley, Sarah A.,	Wollaston.
Dunne, Charles B.,	Brooklyn, N. Y.
Durkee, Dorothy B.,	Worcester.
Eastman, Frances M.,	Amherst.
Edmonds, Mary J.,	Billerica.
Elliot, John,	Groton.
Elliott, S. Maria,	Boston.
Elwell, Susan W.,	Danvers.
Espinosa, Eloisa,	Boston.
Everitt, Mary S.,	Amherst.
Fick, Mrs. H. L. A.,	New York City.
Field, Florence E.,	Gardner.
Flaherty, Marguerite A.,	Hadley.
French, Alice M.,	Lowell.
Frye, Grace E.,	Billerica.
Gaiser, Frederic R.,	New York City.

Gaskill, Marie W.,	.	.	.	.	.	Hopedale.
Gavin, Gertrude L.,	.	.	.	.	.	Roxbury.
Gavin, Madeline R.,	.	.	.	.	.	Roxbury.
Goodnow, Gladys B.,	.	.	.	.	.	Fairhaven.
Gray, Isabelle M.,	.	.	.	.	.	Somerville.
Grundler, A. J.,	.	.	.	.	.	Lowell.
Hall, Mrs. N. L.,	.	.	.	.	.	Boston.
Hamilton, Easter I.,	.	.	.	.	.	Worcester.
Hardy, Fred C.,	.	.	.	.	.	Lancaster.
Harris, Edna M.,	.	.	.	.	.	Meriden, Conn.
Helburn, Theresa,	.	.	.	.	.	Housatonic.
Henry, Margaret L.,	.	.	.	.	.	Norwalk, Conn.
Hobbs, Mary E.,	.	.	.	.	.	Fall River.
Hodsdon, Villa,	.	.	.	.	.	Cambridge.
Honnay, Agnes,	.	.	.	.	.	Amherst.
Hoyt, Minnetta,	.	.	.	.	.	East Saugus.
Hoyt, Mrs. Laura A.,	.	.	.	.	.	Greenfield.
Hubbard, Alice W.,	.	.	.	.	.	Weston.
Hubbard, Olive,	.	.	.	.	.	Amherst.
Jackson, Helen,	.	.	.	.	.	Brookline.
Jacobs, Adeline H.,	.	.	.	.	.	Philadelphia, Pa.
Johns, Lois,	.	.	.	.	.	Amherst.
Junkins, Roland,	.	.	.	.	.	Eliot, Me.
Kattelle, Fannie M.,	.	.	.	.	.	Melrose.
Kebler, Mary W.,	.	.	.	.	.	Cincinnati, O.
Keith, Lucy E.,	.	.	.	.	.	Gardner.
Kingman, Ruth E.,	.	.	.	.	.	Somerville.
Klein, Alice L.,	.	.	.	.	.	Thompsonville, Conn.
Laing, Minerva A.,	.	.	.	.	.	Granville, N. Y.
Lance, Eva E.,	.	.	.	.	.	South Meriden, Conn.
Levin, Ethel H.,	.	.	.	.	.	Amherst.
Lewis, Alice,	.	.	.	.	.	Meriden, Conn.
Li, K. H.,	.	.	.	.	.	China.
Litch, John H.,	.	.	.	.	.	New London, N. H.
Ludwig, Irving F.,	.	.	.	.	.	Jamaica Plain.
Lyman, Ruth,	.	.	.	.	.	North Adams.
McHugh, Ellen,	.	.	.	.	.	Boston.
Mandeville, Ernest,	.	.	.	.	.	Holyoke.
Mandley, Ethel L.,	.	.	.	.	.	New Bedford.
Mason, Isadore H.,	.	.	.	.	.	Gardner.
Mathews, Maude A.,	.	.	.	.	.	Fall River.
Matson, Nathalie,	.	.	.	.	.	Brooklyn, N. Y.
Mellen, Adele L.,	.	.	.	.	.	Cambridge.
Mellen, Edwin D.,	.	.	.	.	.	Cambridge.
Mellen, J. Edwin,	.	.	.	.	.	Cambridge.
Mellen, Lucile C.,	.	.	.	.	.	Cambridge.
Mellen, Richard A.,	.	.	.	.	.	Cambridge.
Menard, Leon J.,	.	.	.	.	.	Holyoke.
Merrill, Earle D.,	.	.	.	.	.	Lewiston, Me.
Mitchell, Edw. A.,	.	.	.	.	.	Cappahosic, Va.
Monk, Anna C.,	.	.	.	.	.	Stoughton.
Morrill, Frances,	.	.	.	.	.	Worcester.
Morris, I. Margaret,	.	.	.	.	.	Jenkintown, Pa.
Neal, Marie J.,	.	.	.	.	.	Pittsfield.
O'Brien, William S.,	.	.	.	.	.	Worcester.
Phelon, Lucy M.,	.	.	.	.	.	Springfield.
Phillips, Ethel M.,	.	.	.	.	.	West Somerville.
Poinier, Helen,	.	.	.	.	.	Newark, N. J.
Price, M.,	.	.	.	.	.	New York, N. Y.
Putnam, Anna A.,	.	.	.	.	.	Worcester.
Rich, Aquila B.,	.	.	.	.	.	Maynard.
Ripley, Lena B.,	.	.	.	.	.	Belchertown.
Robinson, Mary B.,	.	.	.	.	.	Waltham.
Robson, Bertha V.,	.	.	.	.	.	Newtonville.

Rome, Edythe,	Worcester.
Rome, Esther,	Gardner.
Rome, Sophie,	Worcester.
Roop, Ruth L.,	Arlington Heights.
Ruggli, Clara W.,	Cambridge.
Ryan, Bridget A.,	Sunderland.
Sanford, Mrs. Alice P.,	Newark, N. J.
Sanford, Molly E.,	Plainfield.
Sawyer, John H.,	North Brookfield.
Schiefner, Frank H.,	Newton Center.
Schindhelm, Sabine C.,	Brooklyn, N. Y.
Sheridan, Anna K.,	Needham.
Sheridan, Mrs. G. F.,	Winchester.
Sheridan, Kathleen,	Winchester.
Short, George T.,	Springfield.
Smith, Edith L.,	Woburn.
Smith, M. Jeannette,	Woburn.
Spencer, Mary W.,	Northampton.
Stebbins, Blanche,	Lexington.
Taylor, Miss Joe,	North Marshfield.
Terry, Julia S.,	Plainfield.
Tranter, Mrs. Lelia E.,	Ware.
Tufts, Frances W.,	New Braintree.
Turner, Arthur W.,	East Templeton.
Turner, George W.,	Roxbury.
Vance, O. F.,	Shelburne, Vt.
Van Sickle, Schuyler,	Springfield.
Walton, Mrs. F. J.,	Cambridge.
Warren, M. Eva,	Auburndale.
Waterman, Edith G.,	Lowell.
Webb, Bessie E.,	Billerica Center.
Webb, Helen M.,	Billerica Center.
Welch, Elizabeth B.,	Fall River.
Wells, Katherine,	Malden.
Wheeler, Ethel M.,	Bridgeport, Conn.
White, Catharine,	Amherst.
White, Helena,	Amherst.
Winchester, Rena,	Shelburne Falls.
Winslow, Edna M.,	Meriden, Conn.
Young, Edwin B.,	Hinsdale, N. H.
Yost, Emma L.,	Meriden, Conn.

SCHOOL FOR RURAL SOCIAL SERVICE.

Anderson, M. T.,	Chesterfield.
Armitage, Frank G.,	Hampden.
Cary, George E.,	Holden.
Crane, Eleanor R. (Mrs.),	Richmond.
Crane, William M.,	Richmond.
Giles, Mrs. L. M.,	Westminster.
Hamlin, Wm. R.,	Hyde Park, Vt.
Hooper, Elisha,	Charlemont.
Hubbard, Horace R.,	Hubbardston.
Ives, Henry S.,	Westhampton.
Mayer-Oakes, S. R.,	Hadley.
Sibley, Horace A.,	Wendell.
Skilton, Emily M.,	Lowell.
Smith, Laura C.,	Berlin, Conn.

SCHOOL FOR LIBRARY WORKERS.

Abbott, Mrs. J. T.,	North Wilbraham.
Adriance, Mrs. Carrie E.,	Amherst.
Barber, Edith L.,	Athol.

Berard, Margaret A.,	.	.	.	.	.	Turners Falls.
Booth, Mrs. Lucy A.,	.	.	.	.	.	Longmeadow.
Capen, Arthur G.,	.	.	.	.	.	Worthington.
Chapman, Inez E.,	.	.	.	.	.	Amherst.
Collins, Angela W.,	.	.	.	.	.	Rockland.
Conway, Ruth E.,	.	.	.	.	.	Cleveland, O.
Cooper, Miss,	.	.	.	.	.	Greenfield.
Drury, Charlotte H.,	.	.	.	.	.	Rutland.
Dunn, Mrs. Jane C.,	.	.	.	.	.	Ludlow.
Hastings, Mrs. A. B.,	.	.	.	.	.	Warwick.
Hill, Miss,	.	.	.	.	.	Greenfield.
Hill, Myra A.,	.	.	.	.	.	Williamsburg.
Hord, Dorothy E.,	.	.	.	.	.	Turners Falls.
Kellogg, Mary E.,	.	.	.	.	.	Granby.
Kingsley, M. Edna,	.	.	.	.	.	Monroe Bridge.
Lyman, Ethel L.,	.	.	.	.	.	Northampton.
McLauthlen, Mrs. J. F.,	.	.	.	.	.	Kingston.
Paige, Fannie S.,	.	.	.	.	.	BillERICA.
Partenheimer, Louise S.,	.	.	.	.	.	Turners Falls.
Robinson, Harriet E.,	.	.	.	.	.	Ipswich.
Smith, Mrs. F. H.,	.	.	.	.	.	Hadley.
Smith, K. W.,	.	.	.	.	.	Middlefield.

APPLE PACKING SCHOOL.

Backus, Victor T.,	.	.	.	.	.	North Marshfield.
Bowen, Everett A.,	.	.	.	.	.	Lakeville.
Chandler, John,	.	.	.	.	.	Sterling Junction.
Cogswell, W. Cleveland,	.	.	.	.	.	North Scituate.
Elvidge, Avery J.,	.	.	.	.	.	North Grafton.
Fenn, Donald F.,	.	.	.	.	.	Cambridge.
Foster, Charles H.,	.	.	.	.	.	North Andover.
Hall, Fred Porter,	.	.	.	.	.	Danvers.
Hitchcock, Charles F.,	.	.	.	.	.	Gilbertville.
Kellett, Wilfred L.,	.	.	.	.	.	Hopkinton.
Kinney, Frank D.,	.	.	.	.	.	Worcester.
Middleton, Frederick H.,	.	.	.	.	.	Amherst.
Nelson, Paul G.,	.	.	.	.	.	West Newbury.
Patten, Mrs. Robert G.,	.	.	.	.	.	Amesbury.
Richardson, Leroy M.,	.	.	.	.	.	Winchester.
Tuttle, Donald,	Reading.
Tyler, E. Warren,	Athol.
Walker, Henry P.,	Hudson.
West, Louis J.,	Waterboro, Me.

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Massachusetts Agricultural College

SUPPLEMENT TO THE CATALOGUE

MAY, 1916

PUBLISHED BY THE COLLEGE

CALENDAR

1916-17

Regular Courses.

1916.

January 3, Monday, 1 p. m.	. . .	Winter recess ends; regular schedule of classes.
February 7, Monday, 1 p. m.	. . .	Second semester begins; regular schedule of classes.
February 22, Tuesday afternoon,	. . .	Half holiday, Washington's Birthday.
March 24, Friday, 5 p. m.,	. . .	Spring recess begins.
April 3, Monday, 1 p. m.,	. . .	Spring recess ends; regular schedule of classes.
April 19, Wednesday afternoon,	. . .	Half holiday, Patriots' Day.
May 30, Tuesday,	. . .	Holiday, Memorial Day.
June 17-21, Saturday-Wednesday,	. . .	Commencement.
June 22-24, Thursday-Saturday,	. . .	Entrance examinations.
September 13-16, Wednesday-Saturday,	. . .	Entrance examinations.
September 20, Wednesday, 1.30 p. m.,	. . .	Fall term begins; chapel.
October 12, Thursday afternoon,	. . .	Half holiday, Columbus Day.
November 29, Wednesday, 12 m.—Friday, December 1, 1 p. m.,	. . .	Thanksgiving recess.
December 15, Friday, 5 p. m.,	. . .	Fall term closes; Christmas recess begins.

1917.

January 1, Monday, 1 p. m.,	. . .	Christmas recess ends; winter term begins.
February 22, Thursday afternoon,	. . .	Half holiday, Washington's Birthday.
March 23, Friday, 5 p. m.,	. . .	Winter term closes; spring recess begins.
April 2, Monday, 1 p. m.,	. . .	Spring recess ends; spring term begins.
April 19, Thursday afternoon,	. . .	Half holiday, Patriots' Day.
May 30, Wednesday,	. . .	Holiday, Memorial Day.
June 23-27, Saturday-Wednesday,	. . .	Commencement.
June 27, Wednesday,	. . .	Spring term ends.
July 2, Monday,	. . .	Summer term begins.
September 19, Wednesday, 1.30 p. m.,	. . .	Fall term begins.

FOREWORD

The courses of instruction and program, as outlined in this publication, will become effective in September, 1916, and will be regarded as the official status of the courses for the coming year.

Laboratory fees will be charged in accordance with the principle laid down in the regular catalog, but will not be ready for announcement until the Fall of 1916.

The College reserves the right to withdraw and change the announcements made in this statement.

KENYON L. BUTTERFIELD,
President.

May 20, 1916.

COURSES OF INSTRUCTION

TABLE OF FRESHMAN AND SOPHOMORE SUBJECTS.

The figures indicate the number of credit hours a week. For details, see the descriptions of courses.

FRESHMAN YEAR

FIRST TERM

All work required.

Subject	Courses and Numbers	Credit Hours per week
Chemistry	(Chemistry 1 or 4)	3
Algebra	(Mathematics 1)	5
Language	(French or German 1 or 4)	3
English	(English 1)	3
Agriculture & Horticulture	(Agronomy 1, Animal Husbandry 1, Pomology 1, Poultry 1)	2
Tactics	(Military 1)	1
Drill	(Military 4)	1
Hygiene	(Physical Education 1)	1
Public Speaking	(Public Speaking 1) $\frac{1}{3}$ of the class	1
		—
College life	(attendance without credit)	20

SECOND TERM

Chemistry	(Chemistry 2 or 5)	3
Algebra	(Mathematics 2)	2
Trigonometry	(Mathematics 5)	3
Language	(French or German 2 or 5)	3
English	(English 2)	3
Agriculture & Horticulture	(Agronomy 1, Animal Husbandry 1, Pomology 1, Poultry 1)	2
Gymnastics	(Physical Education 5)	1
Geology	(Geology 2)	2
Public Speaking	(Public Speaking 1) $\frac{1}{3}$ of class	1
		—
College life	(attendance without credit)	20

THIRD TERM

Chemistry	(Chemistry 3 or 6)	3
Solid Geometry	(Mathematics 3)	3
Mensuration	(Mathematics 6)	2
Language	(French or German 3 or 6)	3
English	(English 3)	3
Botany	(Botany 3)	3

Tactics	(Military 3)	1
Drill	(Military 6)	1
Public Speaking	(Public Speaking 1) $\frac{1}{3}$ of class	1
		—
College life	(attendance without credit)	20

SOPHOMORE YEAR

FIRST TERM

Required

Subject	Course Number	Class hr.	2 hour Lab. periods	Credit hours per week
Physics	25	3	1	4
Zoölogy	25	1	2	3
Botany	25	1	2	3
English	25	2	—	2
Military	25	1	—	1
Military	28	—	1	1
				—
Total required—				14

Elective

Chemistry	25	1	2	3
French	25 or 28	3	—	3
German	25 or 28	3	—	3
Drawing	25	—	3	3
Animal Husbandry	25	2	1	3
Rural Engineering	25	—	2	2

SECOND TERM

Required

Physics	26	2	1	3
Agr. Economics	26	5	—	5
English	26	2	—	2
Physical Ed.	26	—	1	1
				—
				11

Elective

Chemistry	26	1	2	3
French	26 or 29	3	—	3
German	26 or 29	3	—	3
Mathematics	26	2	—	2
Drawing	26	—	3	3
Entomology	26	3	—	3
Animal Husbandry	26	1	2	3
Rural Engineering	26	—	2	2
Botany	26	1	2	3
Econ. Sociology	26	5	—	5

SOPHOMORE YEAR

THIRD TERM

Required

Subject	Course Number	Class hrs.	2 hour Lab. periods	Credit hrs. per week
Rural Sociology	27	3	—	3
Agronomy	27	4	1	5
English	27	2	—	2
Military	27	1	—	1
Military	30	—	1	1
Total required—				12

Elective

Chemistry	27	1	4	5
Chemistry	30	3	2	5
French	27 or 30	3	—	3
German	27 or 30	3	—	3
Mathematics	27	—	3	3
Drawing	27	—	3	3
Entomology	27	—	2	2
Geology	27	3	2	5
Physics	27	4	1	5
Horticulture	27	2	1	3
Zoölogy	27	1	2	3

MAJORS: JUNIOR AND SENIOR YEARS

GENERAL STATEMENT.

A major consists of 45 credit hours of correlated work, to be arranged by the student and an instructor called the adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average man majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

RULES GOVERNING MAJORS.

RULE 1. Election.—Each student, before the first term of his sophomore year, shall elect a major subject from the list of majors given below; and this major shall consist of 45 credit hours of correlated work.

RULE 2. Minimum Credits.—The minimum number of credits for graduation shall be 220 credit hours, inclusive of military drill and physical education.

RULE 3. Maximum Credits.—The maximum number of credits for any term of the junior or senior year shall be 21.

RULE 4. Humanities and Rural Social Science.—A minimum of 18 credit hours in the Divisions of the Humanities and Rural Social Science will be re-

quired of all students during their junior and senior years, with the following restriction: that a minimum of 5 credit hours will be required in each of the divisions.

RULE 5. *Advisers.*—The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student intends to elect his major. Each student should consult with the adviser as soon as possible. The adviser has full authority to prescribe the student's work up to 45 hours. It is understood, however, that so far as practicable the individual needs of the student will be recognized. It is also hoped and expected that students will be disposed to seek the counsel of the adviser with respect to the remaining courses required for graduation.

RULE 6. *Free Electives.*—Each student during his junior and senior years is required to take 45 hours in his major and also 18 hours in the Divisions of the Humanities and Rural Social Science, making a total of 63 hours. He is allowed free choice of courses to complete his required hours.

RULE 7. *Registration.*—A Sophomore, Junior or Senior shall not register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the registrar's office on June 1.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the year and countersign the card.

(3) Each course card must be filled out, giving the name of student, his college address, the name of parent or guardian, and the student's home address. When the major courses have been entered on this card, and the hours of free elections added by the student, the card must be returned to the registrar not later than June 10.

RULE 8. *Changes.*—Applications for changes may be made to the dean in writing at any time; when approved by him and by the committee on scholarship, they become operative at the beginning of the semester following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

AGRICULTURE. (MAJOR)

Professor JAMES A. FOORD, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agonomy	. . . 50 1*	5	1	An. Hus. 25 Ru. Eng. 25	3 2	Agrom. 50 Dairy 50	5 5	An. Hus. 75 Ru. Eng. 75	3 5
Agonomy	. . . 76 3	5							
An. Husbandry	. . . 51 3	5							
An. Husbandry	. . . 75 1	3	2	Math. 26 An. Hus. 26 Ru. Eng. 26	2 3 2			Farm Ad. 75 An. Hus. 76	5 3
An. Husbandry	. . . 76 2	3							
Dairying	. . . 50 1	5							
Farm Mgt.	. . . 75 2	3	3	Chem. 30 Math. 27 Hort. 27	5 3 3	Micro. 50 An. Hus. 51	5 5	Agrom. 76 Farm Mgt. 76	5 5
Farm Mgt.	. . . 76 3	5							
Microbiology	. . . 50 1	5							
or									
Microbiology	. . . 50 3	5	4						
Rural Eng.	. . . 75 1	5							
		—							
		44							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Animal Husbandry 25 and 26, Rural Engineering (Shop Work) 25 and 26, Chemistry 30, Mathematics 26 and 27, and Horticulture 27.

Additional Information.—Animal Husbandry 50, Dairying 52, Pomology 50 and 51, Rural Engineering 78, and Veterinary 51 are suggested as additional courses for the student fitting himself for general agriculture.

AGRONOMY. (MAJOR)

Professor SIDNEY B. HASKELL, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agronomy	. . . 50 1 *	5	1	Chem. 25	3	Agron. 50	5	Agron. 75	5
Agronomy	. . . 51 3	5		Germ. or 28	3	Chem. 51	8	An. Hus. 75	5
Agronomy	. . . 75 1	5							
Agronomy	. . . 77 2	5	2	Bot. 26	3				
An. Husb.	. . . 75 1	3		Chem. 26	3	Chem. 52	8	Agron. 77	5
Chemistry	. . . 51 1	8		Germ. or 29	3				
Chemistry	. . . 52 2	8	3	Math. 26	2				
Farm Mgt.	. . . 76 3	5		27	3	Agron. 51	5	Farm Mgt. 76	5
	. . . —	44		Germ. or 30	3				
			4	Math. 27	5				
				Geol. 27					

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Chemistry 25 and 26, German 25 or 28, 26 or 29, 27 or 30, Geology 27, Botany 26. Advised.—Mathematics 26 and 27.

ANIMAL HUSBANDRY. (MAJOR)

Professor JOHN C. MCNUTT, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agronomy	. . . 50 1*	5	1	An. Hus. 25	3	Agron. 50 Vet. 50 Dairy. 50	5 5 5	An. Hus. 75	3
An. Husbandry	. . . 51 3	5							
An. Husbandry	. . . 50 2	1							
An. Husbandry	. . . 52 3	3	2	An. Hus. 26	3	An. Hus. 50	1	An. Hus. 76 An. Hus. 78 Farm Mgt. 75	3 3 3
An. Husbandry	. . . 75 1	3							
An. Husbandry	. . . 76 2	3							
An. Husbandry	. . . 77 3	3	3	Chem. 30	5	An. Hus. 51 An. Hus. 52	5 3	An. Hus. 80 An. Hus. 77 Farm Mgt. 76	1 3 5
An. Husbandry	. . . 78 2	3							
An. Husbandry	. . . 80 3	1							
Dairying	. . . 50 1	5	4						
Farm Mgt.	. . . 75 2	3							
Farm Mgt.	. . . 76 3	5							
Veterinary	. . . 50 1	5							
		—							
		45							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Animal Husbandry 25 and 26, Chemistry 30.

Additional Information.—The balance of the Sophomore electives allowed are left to the student to choose.

DAIRYING. (MAJOR)

Professor WILLIAM P. B. LOCKWOOD, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Animal Husb.	. . . 52 3*	3	1	An. Hus. 25 Ru. Eng. 25	3 2	Dairy. 50 Micro. 50	5 5	An. Hus. 75 Micro. 82	3 5
Animal Husb.	. . . 75 1	3							
Animal Husb.	. . . 76 2	3							
Dairying	. . . 50 1	5		An. Hus. 26 Ru. Eng. 26	3 2	Ru. Eng. 77 Micro. 51 (Preq. to 82)	5 5	Farm Mgt. 75 An. Hus. 76 Dairy. 75	3 3 5
Dairying	. . . 51 3	5	2						
Dairying	. . . 75 2	5							
Dairying	. . . 76 3	5		Chem. 30	5	An. Hus. 52 Dairy. 51	3 5	Dairy. 76	5
Farm Mgt.	. . . 75 2	3	3						
Microbiology	. . . 50 1	5							
Microbiology	. . . 82 1	5							
Rural Eng.	. . . 77 2	5	4						
		—							
		47							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Animal Husbandry 25 and 26, Rural Engineering 25 and 26, Chemistry 30.
Additional Information.—The balance of the Sophomore electives allowed are left to the student to choose.

POULTRY HUSBANDRY. (MAJOR)

Professor JOHN C. GRAHAM, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agronomy	. . . 50 1*	5	1			Poult. 50 Poult. 51 Agron. 50	3	Poult. 76 Poult. 77 Vet. 85	5 5 3
Animal Husb.	. . . 51 3	5							
Poultry Husb.	. . . 50 1	3							
Poultry Husb.	. . . 51 1	2	2			Poult. 52	3	Poult. 75 Vet. 86	5 3
Poultry Husb.	. . . 52 2	3							
Poultry Husb.	. . . 53 3	5							
Poultry Husb.	. . . 54 3	2	3			Poult. 53 Poult. 54 An. Hus. 51	5 2 5		
Poultry Husb.	. . . 75 2	5							
Poultry Husb.	. . . 76 1	5							
Poultry Husb.	. . . 77 1	5	4						
Veterinary Sc.	. . . 85 1	3							
Veterinary Sc.	. . . 86 2	3							
	—	46							

*The heavy faced type indicates the term in which the course is given.

Additional Information.—The Sophomore electives allowed are left to the student to choose.

FLORICULTURE. (MAJOR)

Associate Professor ARNO H. NEHRING, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Botany	. . . 50 1*	2	1	Drawing 25	3	Flori. 50 Flori. 53 Bot. 50	4	Flori. 75 Hort. 50	3 5
Botany	. . . 51 2	2					3		
Entomology	. . . 26 2	3					2		
Floriculture	. . . 50 1	4	2	Drawing 26 Ent. 26 Botany 26	3 3 3	Flori. 51 Ent. 26 Bot. 51	4 5 2	Flori. 77	3
Floriculture	. . . 51 2	4							
Floriculture	. . . 52 3	4							
Floriculture	. . . 53 1	3	3	Drawing 27 Ent. 27 Hort. 27	3 2 3	Flori. 52	4	Flori. 76 Flori. 78 Hort. 51	3 3 5
Floriculture	. . . 75 1	3							
Floriculture	. . . 76 3	3							
Floriculture	. . . 77 2	3	4						
Floriculture	. . . 78 3	3							
Horticulture	. . . 50 1	5							
Horticulture	. . . 51 3	5							
		—							
		44							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Drawing 25, 26 and 27; Entomology 26 and 27; Botany 26 and Horticulture 27.

Additional Information.—The balance of the Sophomore electives allowed are left to the student to choose. Horticulture 50 and 51 will be taken by seniors.

FORESTRY. (MAJOR)
Professor WILLIAM D. CLARK, Adviser

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Botany	84 2*	5	1	Draw. 25	3	Forst. 50	3	Forst. 75	5
Botany	85 3	5		Ru. Eng. 25	2	L. Gard. 50	5	Ent. 75	4
Entomology	75 1	4				Hort. 50	5		
Forestry	50 1	3	2	Draw. 26	3	Forst. 51	3	Bot. 84	5
Forestry	51 2	3		Math. 26	2				
Forestry	53 3	3		Ent. 26	3				
				Bot. 26	3				
Forestry	75 1	5	3	Draw. 27	3	Forst. 53	3	Bot. 85	5
Forestry	78 3	3		Math. 27	2	Hort. 51	5	Forst. 78	3
Horticulture	50 1	5		Ent. 27	3				
				Hort. 27	3				
Horticulture	51 3	5	4						
Land. Gard. . . .	50 1	5							
		46							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Drawing 25, 26 and 27, Rural Engineering 25, Mathematics 26 and 27, Entomology 26 and 27, Botany 26, Horticulture 27.

LANDSCAPE GARDENING. (MAJOR)
Professor FRANK A. WAUGH, *Advisor*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Horticulture	. . . 50 1*	5	1	Draw. 25	3	L. Gard. 50 Hort. 50 Draw. 25	5	L. Gard. 75	3
Horticulture	. . . 51 3	5					5		
Land. Gard.	. . . 50 1	5					3		
Land. Gard.	. . . 51 2	4	2	Draw. 26 Math. 26 Ent. 26	3 2 3	L. Gard. 51 Draw. 26	4 3	L. Gard. 76	4
Land. Gard.	. . . 52 3	5							
Land. Gard.	. . . 53 4	5							
Land. Gard.	. . . 75 1	3	3	Draw. 27 Math. 27 Hort. 27	3 3 3	L. Gard. 52 Hort. 51 Draw. 27	5 5 3	78 L. Gard. or 79 L. Gard. 77	3 4
Land. Gard.	. . . 76 2	4							
Land. Gard.	. . . 77 3	4							
Land. Gard.	. . . 78 3 or 79 3	3	4			L. Gard. 53	5		
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43									

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Drawing 25, 26 and 27, Mathematics 26 and 27, Horticulture 27. Advised, Entomology 26. Additional Information.—Juniors in 1916-17 required to take Drawing 25, 26 and 27.

POMOLOGY. (MAJOR)
Professor FRED C. SEARS, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agronomy	. . .	75 1*	5						
Botany	. . .	50 1	2						
Botany	. . .	51 2	2						
Entomology	. . .	26 2	3						
Entomology	. . .	27 3	2						
Pomology	. . .	50 1	3						
Pomology	. . .	51 2	3						
Pomology	. . .	52 3	3						
Pomology	. . .	75 1	3						
Pomology	. . .	76 2	3						
Pomology	. . .	77 1	5						
Pomology	. . .	78 3	3						
			37						

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Horticulture 27, Entomology 26 and 27, Botany 26.

Advised.—Rural Engineering 25 and 26.

Additional Information.—The balance of the Sophomore electives allowed are left to the student to choose.

ECONOMIC BOTANY. (MAJOR)
Professor A. VINCENT OSMUN, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Botany	.	.	.	.	.	.	.	.	.
Botany	52	1*	3	Chem. 25	3	Bot. 52	3	Bot. 75	5
Botany	53	2	3	25		Bot. 55	3	Bot. 78	5
Botany	54	3	3	Germ. or	3	Chem. 51	8	Bot. 86	1
Botany	55	1	3	28					
Botany	56	2	3						
Botany	.	.	.						
Botany	75	1	5	Chem. 26	3	Bot. 53	3	Bot. 76	5
Botany	76	2	5	26		Bot. 56	3	Bot. 79	5
Botany	77	3	5	Germ. or	3			Bot. 82	3
Botany	78	1	5	29				Bot. 87	1
Botany	79	2	5	Bot. 26	3				
Botany	80	3	5						
Botany	.	.	.						
Botany	82	2	3	27		Bot. 54	3	Bot. 77	5
Botany	83	3	3	Germ. or	3			Bot. 80	5
Botany	86	1	1	30				Bot. 83	3
Botany	87	2	1					Bot. 88	1
Botany	88	3	1						
Chemistry	51	1	8						
	.	.	.						
	62								
			4						

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—German 25 or 28, 26 or 29, 27 or 30, Botany 26. Advised.—Chemistry 25 and 26.
Additional Information.—The balance of the Sophomore electives allowed are left to the student to choose. Selection of 45 credits of the above (Pathology 75, 76 and 77; Physiology 78, 79 and 80).

AGRICULTURAL CHEMISTRY. (MAJOR)

Associate Professor CHARLES A. PETERS, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Chemistry	. . . 51 1 *	8	1	Chem. 25	3	Chem. 51	8	Chem. 76	5
Chemistry	. . . 52 2	8		25		Chem. 60	3	Chem. 80	5
Chemistry	. . . 60 1	3		Germ. or	3				
Chemistry	. . . 61 2	3		28					
Chemistry	. . . 62 3	3							
Chemistry	. . . 65 3	5	2	Chem. 26	3	Chem. 52	8	Chem. 77	3
Chemistry	. . . 76 1	5		26		Chem. 61	3	Chem. 90, 92, 94	3
Chemistry	. . . 77 2	3		Germ. or	3				
Chemistry	. . . 80 1	5		29					
Chemistry	. . . 87 3	3		Ent. 26	3				
Chemistry	. . . 90 2	3	3	Chem. 27	5	Chem. 62	3	Chem. 91, 93, 95	5
Chemistry	. . . 92 2	3		27		Chem. 65	5	Chem. 87	3
Chemistry	. . . 94 2			Germ. or	3				
Chemistry	. . . 91 3	5		30					
Chemistry	. . . 93 2			Ent. 27	2				
Chemistry	. . . 95 3	—	4						
		54**							

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—Chemistry 25, 26 and 27.

Advised.—German 25 or 28, 26 or 29, 27 or 30, Entomology 26 and 27.

Additional Information.—The balance of the Sophomore electives allowed are left for the student to choose.

**To get the allowed 45 credits the student will select one of the following groups of courses: 90 and 91, or 92 and 93, or 94 and 95 together with the balance from courses shown above.

ECONOMIC ENTOMOLOGY. (MAJOR)

Professor HENRY T. FERNALD, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Botany	. . . 50 1*	2	1	French 25-28 or Germ. 25-28 Chem. 25	3	Bot. 50 Zoo. 50	2	Ent. 76	5
Entomology	. . . 26 2	3					3		
Entomology	. . . 27 3	2			3				
Entomology	. . . 75 3	4	2	French 26-29 or Germ. 26-29 Ent. 26 Bot. 26	3	Ent. 26 Zoo. 51	3	Ent. 77 Zoo. 76 Ent. 90	3 3 3
Entomology	. . . 76 1	5			3				
Entomology	. . . 77 2	3			3				
Entomology	. . . 78 3	4	3	French 27-30 or Germ. 27-30 Ent. 27 Zoo. 27	3	Ent. 27 Zoo. 52	2	Ent. 78 Ent. 75	4 4
Entomology	. . . 90 2	3			2				
Zoölogy	. . . 50 1	3			3				
Zoölogy	. . . 51 2	3	4						
Zoölogy	. . . 52 3	3							
Zoölogy	. . . 54 2	3							
									38

*The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required—Entomology 26 and 27, Zoölogy 27, Botany 26.

Advised—French or German 25 or 28, 26 or 29, 27 or 30; Chemistry 25.

Additional Information.—The balance of the Sophomore electives allowed are left for the student to choose. Juniors are advised to take Entomology 60. In 1916-17, Entomology 26 and 27 will be taken by Juniors as part of their major. Beginning 1917-18, the regular Junior courses 50, 51 and 52 will be in operation.

MICROBIOLOGY. (MAJOR)

Professor CHARLES E. MARSHALL, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Chemistry	51 [*] 1	8	1	Chem. 25	3	Micro. 50	5	Micro. 81	5
Chemistry	52 2	8		Germ. or 28	3	Micro. 51 Chem. 51	5 8	Micro. 82 Micro. 83	5 5
Microbiology or Microbiology	50 1 50 3	5							
Microbiology or Microbiology	51 1 51 2	5	2	Chem. 26	3	Micro. 51	5	Micro. 75	5
Microbiology or Microbiology	51 2 51 3	5		Germ. or 29	3	Chem. 52	8	Micro. 80 Dairy. 75	5 5
Microbiology or Microbiology	52 3 81 1	5							
Microbiology or Microbiology	82 1 83 1	5	3	Chem. 27	5	Micro. 50	5	Micro. 76	5
Microbiology or Microbiology	80 2 75 2	5		Germ. or 30	3	Micro. 51 Micro. 52	5 5		
Microbiology or Dairying	75 1	5							
	— 41		4						

^{*}The heavy faced type indicates the term in which the course is given.

Sophomore Elective Prerequisites: Required.—German 25 or 28, 26 or 29, 27 or 30, Chemistry 25, 26 and 27.

Additional Information.—The balance of the Sophomore electives allowed are left for the student to choose. Microbiology 51, Fall term, will be taken by students who have had Microbiology 50 the preceding Spring.

RURAL JOURNALISM. (MAJOR)

Associate Professor ROBERT W. NEAL, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
R. Journalism . . .	50 1*	3	1			Journ. 50 Journ. 53 Agr. Sc. 51	3 3 5	Journ. 77 Journ. 80	3 4-5
R. Journalism . . .	51 2	3							
R. Journalism . . .	52 3	3							
R. Journalism . . .	53 1	3	2			Journ. 51 Journ. 54 Ec. Soc. 51	3 3 5	Journ. 78 Journ. 81	3 4-5
R. Journalism . . .	54 2	3							
R. Journalism . . .	55 3	3							
R. Journalism . . .	77 1	3	3			Journ. 52 Journ. 55	3 3	Journ. 79 Journ. 82	3 4-5
R. Journalism . . .	78 2	3							
R. Journalism . . .	79 3	3							
R. Journalism . . .	80 1	4 or 5	4						
R. Journalism . . .	81 2	4 or 5							
R. Journalism . . .	82 3	4 or 5							
39-42									

*The heavy faced type indicates the term in which the course is given.

Additional Information.—The Sophomore electives allowed, are left to the students to choose. Major students will take two courses of the groups 50, 51 and 52; 53, 54 and 55; and 77, 78 and 79. The adjustments will be made according to the individual case. Groups 80, 81 and 82 will ordinarily be taken for the full three terms. For the remaining part of the 45 required major credits the student will take Economic Sociology 51 and Agricultural Economics 51, and elect from the following: Economic Sociology 26, Advanced French, German, Spanish, English Literature, History and Government 76, Entomology 90 and certain other courses especially suitable in the different divisions.

AGRICULTURAL ECONOMICS. (MAJOR)
Professor ALEXANDER E. CANCE, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agri. Economics . .	50 1*	5	1			Agr. Ec. 50	5	Agr. Ec. 75	5
Agri. Economics . .	52 2	5							
Agri. Economics . .	75 1	5							
Agri. Economics . .	76 2	5	2			Agr. Ec. 52	5	Agr. Ec. 76	5
or						Ru. Soc. 51	3	Ru. Soc. 78	5
Agri. Economics . .	77 3					Ec. Soc. 51	5		
Ec. Sociology . .	51 2	5							
Ec. Sociology . .	52 3	5	3			Ec. Soc. 52	5	Farm Mgt. 76	5
Farm Mgt. . .	76 3	5				Ru. Soc. 52	3	Agr. Ec. 77	5
Rural Sociology . .	51 2	3							
Rural Sociology . .	52 3	3							
Rural Sociology . .	78 2	5	4						
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		46							

*The heavy faced type indicates the term in which the course is given.

Additional Information.—The Sophomore electives allowed are left to the student to choose.

AGRICULTURAL EDUCATION. (MAJOR)

Professor WILLIAM R. HART, *Advisor*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agri. Education	. . 50 1*	5	1			Bot. 50 Agr. Ed. 50 Agron. 50 Pom. 50	2 5 5 3	Agron. 75 Poult. 50 Dairy. 77	5 3 5
Agri. Education	. . 51 2	5							
Agri. Education	. . 52 4	5							
Agri. Education	. . 53 3	5	2			Agr. Ed. 51 Bot. 51	5 2	Farm Mgt. 75	3
Agronomy	. . 50 1	5							
Agronomy	. . 75 1	5							
Botany	. . 50 1	2	3			M. Gard. 50 Agr. Ed. 53	3 5		
Botany	. . 51 2	2							
Dairying	. . 77 1	5							
Farm Mgt.	. . 75 2	3	4			Agr. Ed. 52	5		
Mark. Gard.	. . 50 3	3							
Pomology	. . 50 1	3							
Poultry Husb.	. . 50 1	3							
		—							
		51							

*The heavy faced type indicates the term in which the course is given.

Additional Information.—The Sophomore electives allowed are left to the student to choose.

Substitutions of other technical courses for some of those above mentioned may be made to meet the needs of individual students.

A selection is allowed of Poultry Husbandry 50 and Market Gardening 50, making 6 credits, or Agronomy 75, 5 credits, making the total credits 45 or 46.

RURAL SOCIAL SCIENCE. (MAJOR)

Professor JOHN PUELAN, *Adviser*

Course	New No.	Cr.	Term	Sophomore	Cr.	Junior	Cr.	Senior	Cr.
Agri. Economics	. . . 50 1*	5	1			Agri. Ec. 50 Agr. Ec. 51 Ru. Soc. 50	5 5 3	Ru. Soc. 75	3
Agri. Economics	. . . 51 1	5							
Ec. Sociology	. . . 51 2	5							
Ec. Sociology	. . . 76 3	5	2			Ru. Soc. 51 Agr. Ed. 52 Ec. Soc. 51	3 5 5	Ru. Soc. 77 Hst. & Govt. 75 Ru. Soc. 78	3 3 5
Hist. & Govt.	. . . 75 2	3							
Rural Journalism	. . . 55 3	3							
Rural Sociology	. . . 50 1	3	3			Ru. Journ. 55 Ru. Soc. 52	3 3	Ru. Soc. 75 Ec. Soc. 76	3 5
Rural Sociology	. . . 52 3	3							
Rural Sociology	. . . 51 2	3							
Rural Sociology	. . . 77 2	3							
Rural Sociology	. . . 75 1		4						
or Rural Sociology	. . . 75 3	3							
Agri. Education	. . . 52 2								
or Rural Sociology	. . . 78 2	5							
		—							
		46							

*The heavy faced type indicates the term in which the course is given.

Additional Information.—The Sophomore electives allowed are left to the student to choose.

DIVISION OF AGRICULTURE.

Professor FOORD.

AGRONOMY.

Professor HASKELL, Assistant Professor JONES, MR. MERKLE, MR. COBB.

1. **1 and 2. AGRONOMY.**—Freshman. Given as part of the Freshman Agriculture and Horticulture. This course aims, by actual contact with the plants and their products, to make the student familiar with the most common farm crops of Massachusetts and their uses. The crops studied are maize, cereals, grasses, legumes, potatoes and root crops. Six weeks, part of class only, 1st Term; balance of class six weeks during the 2nd Term.

2 2-hour laboratory periods, credit 1.

Assistant Professor JONES and Assistants.

27. **3. SOILS AND FERTILIZERS.**—Sophomores. A study of the soils and their properties, soil management, methods of soil improvement and maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments.

4 class hours.

1 2-hour laboratory period, credit 5.

Professor HASKELL and Assistants.

Prerequisite, Freshman required chemistry.

50. **1. FIELD AND FORAGE CROPS.**—For Juniors, Seniors may elect. History, classification and production of maize and of those grasses, legumes, forage and root crops suited to New England conditions. The work includes lecture, laboratory and field study of these various crops.

2 class hours.

3 2-hour laboratory periods, credit 5.

Assistant Professor JONES and MR. COBB.

Prerequisites, Agronomy 27, Botany 3.

51. **3. ADVANCED FIELD CROPS.**—For Juniors, Seniors may elect. A study of the cereal grains, with lectures, laboratory and field study of the purity, quality and vitality of the seeds of farm crops and the handling, grading and judging of their products.

3 class hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor JONES and MR. COBB.

Prerequisite, Agronomy 50.

75. **1. ADVANCED SOILS.**—For Seniors, Juniors may elect. A field, lecture and laboratory course on soils and their adaptability to different uses. The field work consists of a detailed soil survey of the college farm and other areas, followed by a laboratory study of the physical properties of soils collected.

2 class hours.

3 2-hour laboratory periods, credit 5.

Professor HASKELL and MR. MERKLE.

Prerequisite, Agronomy 27.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

76. **3. DRAINAGE AND IRRIGATION.**—For Seniors, Juniors may elect. A field and lecture course on soil improvement by drainage and irrigation with special reference to problems of this nature as faced by Massachusetts farmers. 2 class hours. 1 2 and 1 4-hour laboratory period, credit 5.

Professor HASKELL and Mr. MERKLE.

Prerequisites, Mathematics 26 and 27, Agronomy 27.

77. **2. MANURES AND FERTILIZERS.**—Seniors. An advanced course, giving a general discussion of the different theories which have been held relative to the functions and importance of manures and fertilizers, and leading up to the views at present accepted. Considerable attention is devoted to consideration of the experimental work which has been done, and which is now in progress.

4 class hours.

1 2-hour laboratory period, credit 5.

Professor HASKELL.

Prerequisite, Agronomy 27.

78. **2. BREEDING OF FIELD CROPS.**—Seniors. This course deals with the improvement, by selection and breeding, of the crops studied in Courses 50 and 51.

3 class hours.

Assistant Professor JONES.

Prerequisite, Agronomy 51.

ANIMAL HUSBANDRY.

Professor McNUTT, Assistant Professor QUAIFF, MR. FISH.

1. **1 and 2. ANIMAL HUSBANDRY.**—Freshman. Given as part of the Freshman Agriculture and Horticulture. This course is outlined to give the student a greater appreciation of animal husbandry. Demonstrations will be given and judging will be done to familiarize the student with the various breeds and market classes. Six weeks, part of class only, 1st Term; balance of class six weeks during the 2nd Term.

2 2-hour laboratory periods, credit 1.

ANIMAL HUSBANDRY DEPARTMENT.

25. **1. BREEDS AND TYPES OF LIVE STOCK.**—Sophomores. A course covering the origin, history, development and characteristics of the different breeds of horses, cattle, sheep and swine. Text-book, Plumb's "Breeds and Types of Farm Animals."

1 lecture.

2 2-hour laboratory periods, credit 3.

Assistant Professor QUAIFF.

26. **2. BREEDS AND TYPES OF LIVE STOCK.**—Sophomores. Continuation of Course 25.

1 lecture.

2 2-hour laboratory periods, credit 3.

Assistant Professor QUAIFF.

Prerequisite, Animal Husbandry 25.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

50. **2. LIVE STOCK MANAGEMENT.**—For Juniors, Seniors may elect. The work of this course consists of laboratory work by the individual students in the handling of live stock; with horses, such work as halter breaking, harnessing, casting and fitting for show will be done; similarly, the practical handling of cattle, sheep and swine will be fully treated. Special study is given to halter making, splicing, hitches, knots and all rope work.

1 2-hour laboratory period, credit 1.

Assistant Professor QUAIFFE.

Prerequisites, Animal Husbandry 25 and 26.

51. **3. PRINCIPLES OF BREEDING.**—For Juniors, Seniors may elect. This course is designed to familiarize the student with the problems involved in animal and plant improvement; to acquaint him with the facts which are already established; to scrutinize prevailing theories; and to indicate the lines and methods of further work. Some of the subjects studied are: variations, their causes and heritability; DeVrie's theory of mutations; the inheritance of acquired characters; the pure line; Mendelian law; the making of new types; the determination of sex; applications to human heredity. A few periods at the end of the course are devoted especially to the application of principles in live stock improvement. "Genetics," by Herbert E. Walter. Supplementary reading.

Credit 5.

Professor McNUTT.

Prerequisite, Zoology 25.

52. **3. ADVANCED STOCK JUDGING.**—For Juniors, Seniors may elect. This course is designed to equip animal husbandry students in the judging of classes of different types of live stock; to strengthen them in the selection of superior sires; and equip them for stock judging at fairs. Visits will be made to the best herds for the various breeds of stock in the State. Judging teams to represent the college will be selected largely from this class.

1 2 and 1 4-hour laboratory period, credit 3.

Professor McNUTT.

Prerequisite, Animal Husbandry 50.

75. **1. FEEDING AND MANAGEMENT.**—For Seniors, Juniors may elect. A study of the principles of animal nutrition; of the composition and qualities of feeding materials. Text-book, Henry's "Feeds and Feeding."

3 class hours.

Credit 3.

Assistant Professor QUAIFFE.

Prerequisite, Chemistry 30 or 51.

76. **2. FEEDING AND MANAGEMENT.**—For Seniors, Juniors may elect. A study of the feeding, care and management of dairy cattle from birth to maturity, with especial attention to economic production. Text-book, Henry's "Feeds and Feeding."

3 class hours.

Credit 3.

Professor McNUTT.

Prerequisite, Chemistry 30 or 51.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

77. **3. FEEDING AND MANAGEMENT.**—For Seniors, Juniors may elect. A continuation of Courses 75 and 76, dealing in a similar manner with horses, sheep, beef cattle and swine.

3 class hours.

Credit 3.

Assistant Professor QUAIPE.

Prerequisite, Animal Husbandry 75.

78. **2. HERD AND STUD-BOOK STUDY.**—For Seniors, Juniors may elect. An advanced course in the study of the breeds of live stock, familiarizing the student with the detailed history of the breed, the most productive sires and dams of the various breeds, and the successful lines and methods of breeding.

1 class hour.

2 2-hour laboratory periods, Credit 3.

Professor McNUTT.

Prerequisite, Animal Husbandry 75.

80. **3. SEMINAR.**—For Seniors majoring in Animal Husbandry only. Advanced study upon questions pertaining to live stock and live stock production. Each student electing this work will choose some particular line of work in which he is specially interested, and will pursue study in this subject by reading, compilation and research. There will be no regular lecture period, but seminars will be held. A satisfactory report of the results must be presented in a thesis.

1 2-hour laboratory period, credit 1.

Professor McNUTT.

DAIRYING.

Professor LOCKWOOD, Assistant Professor JAMISON, MR. COONS, MR. BALDINGER.

Elective Courses.

50. **1. MILK AND MILK COMPOSITION.**—For Juniors, Seniors may elect. The development of the dairy business in the United States; the composition, secretion and general characteristics of milk; contamination and fermentation; the study of analysis of milk products by use of the Babcock test for fat, tests for acidity and adulteration, and ordinary preservatives; moisture tests for butter; methods for testing herds and developing them to higher efficiency; problems.

3 class hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor JAMISON and the DEPARTMENT.

51. **3. BUTTERMAKING.**—For Juniors, Seniors may elect. A study of separators and cream separation; handling milk and cream for buttermaking; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; management; problems; dairy machinery and care thereof.

2 class hours.

2 3-hour laboratory periods, credit 5.

MR. COONS and the DEPARTMENT.

Prerequisite, Dairying 50.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

75. **2. MARKET MILK.**—For Seniors, Juniors may elect. A study of market milk conditions; extent and development of the business; supply and delivery; food value of milk and its uses as food; milk and its relation to the public health; proper methods for handling milk and cream for direct consumption; certified milk, requirements and production; pasteurizing; sterilizing; standardizing and modifying; milk laws and inspection.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor LOCKWOOD and the DEPARTMENT.

Prerequisite, Dairying 50.

76. **3. MILK PRODUCTS.**—For Seniors, Juniors may elect. The manufacture of milk products other than butter, including cheddar cheese, soft and fancy cheese, ice cream, condensed milk, casein, milk powder, etc. Laboratories, largely the making of soft and fancy cheese and ice cream.

2 class hours.

2 3-hour laboratory periods, credit 5.

MR. BALDINGER.

Prerequisite, Dairying 75.

77. **1. DAIRYING.**—For Seniors, Juniors may elect. A course designed primarily for teachers of secondary agriculture. The work given will cover briefly the composition and secretion of milk, the Babcock fat test, the relation of bacteria to dairy work and principles of creaming; separators; elementary buttermaking; proper methods of handling milk and cream; and the relation of market milk to the public health.

3 lecture hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor JAMISON and the DEPARTMENT.

FARM MANAGEMENT

Professor FOORD, MR. PEACOCK.

Elective Courses.

75. **2. FARM AND COST ACCOUNTING.**—For Seniors, Juniors may elect. A study of the principles of accounting and their application to the large or small farm. Actual practice with records and cost accounting.

1 class hour.

2 2-hour laboratory periods, credit 3.

Professor FOORD, MR. PEACOCK.

76. **3. FARM MANAGEMENT.**—For Seniors, Juniors may elect. The organization of the farm as a business enterprise. A discussion and study of some of the problems that confront the modern farmer, such as the choice of a farm, systems and types of farming, labor, marketing, records and farm accounts.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor FOORD.

Prerequisites, Agronomy 50, Animal Husbandry 25 and 26.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

POULTRY HUSBANDRY.

Professor GRAHAM, DR. GOODALE, MR. PAYNE.

1. **1 and 2. POULTRY HUSBANDRY.**—Freshman. Given as part of the Freshman Agriculture and Horticulture. This course consists of a study of the characteristics of the most important breeds and varieties of poultry based upon the classification in the Standard of Perfection. This will embrace both standard and utility qualities. The work on comparison will be based on the key. A special score card will be used for utility judging. Attention will be given to the adaptation of the most popular varieties, to the more highly specialized lines of poultry culture and to the part played by poultry in New England agriculture. Six weeks, part of class only, 1st Term; balance of class six weeks during the 2nd Term.

2 2-hour laboratory periods, credit 1.

POULTRY DEPARTMENT.

Elective Courses.

50. **1. ELEMENTS OF POULTRY CULTURE.**—For Juniors, Seniors may elect. This course consists of a comprehensive study of poultry-house construction, poultry-house equipment, feeds and feeding, winter-egg production, types and breeds of poultry.

3 class hours.

Credit 3.

Professor GRAHAM.

51. **1. POULTRY PRACTICE WORK.**—For Juniors, Seniors may elect. This is a practical laboratory course in poultry carpentry, caponizing, killing and picking; dressing and packing poultry, sorting and preparing eggs for market.

2 2-hour laboratory periods, credit 2.

MR. PAYNE.

Prerequisite: Must be accompanied by Poultry 50.

52. **2. ELEMENTS OF POULTRY CULTURE.**—For Juniors, Seniors may elect. This course treats the subjects of incubation, brooding, care of growing stock, breeding, market poultry, including capons, roasters and broilers, and diseases of poultry.

3 class hours.

Credit 3.

Professor GRAHAM.

Prerequisite, Poultry 50.

53. **3. INCUBATION AND BROODING.**—For Juniors, Seniors may elect. In this course students are required to set up and operate incubators and brooders, make a systematic study of the development of the chick in the egg, and the care of sitting hens. Laboratory time by arrangement.

1 class hour.

4 2-hour laboratory periods, credit 5.

MR. PAYNE.

Prerequisite, Poultry 52.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

54. **3. PEN MANAGEMENT.**—For Juniors, Seniors may elect. This is a practical laboratory course. Students are required to care for a pen of fowls, keeping accurate records of eggs produced, food consumed, weather conditions, health of fowls, and profit and loss.

1 2-hour laboratory period, credit 1.

MR. PAYNE.

Prerequisite, Poultry 50.

55. **3. INVESTIGATIONAL WORK.**—For Juniors, Seniors may elect. This course is designed especially for students who are planning to do experiment station work. Students will be assigned specific problems to work out experimentally, or they may be required to assist in carrying on such work.

1 to 5 2-hour laboratory periods, credit 1-5.

DR. GOODALE.

75. **2. POULTRY MANAGEMENT.**—Seniors. A detailed study of large poultry farms and their equipment, such as bone cutters, feed cutters, cramming machines, etc.; the laying out and planning of poultry buildings of all kinds; mating of fowls. Attention to poultry diseases and investigation work carried on by experiment stations is prominent. A few good poultry plants will be visited by the class for practical demonstrations.

5 class hours.

Credit 5.

Professor GRAHAM.

Prerequisites, Poultry 53, 54, 76 and 77.

76. **1. ADVANCED POULTRY JUDGING.**—Seniors. This course includes a study of the origin and history of breeds and varieties, poultry organizations and poultry shows. The American Standard of Perfection will be used as a text.

2 class hours.

3 2-hour laboratory periods, credit 5.

Prerequisite, Poultry 53.

77. **1. MARKET POULTRY AND POULTRY PRODUCTS.**—Seniors. This course includes the study of market classifications of poultry, eggs and feathers, the requirements of different markets, methods of marketing, advantages and disadvantages of cold storage of poultry and eggs. Students will be required to fatten several lots of chickens by different methods and rations. Accurate data must be kept showing the gain in weight and quality, also the cost of feed, labor, etc., and the profit and loss. Judging and scoring of market poultry, both alive and dressed and market eggs will be an important feature of this course.

2 class hours.

3 2-hour laboratory periods, credit 5.

MR. PAYNE.

Prerequisites, Poultry 50, 51 and 52.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

RURAL ENGINEERING.

Professor GUNNESS.

Elective Courses.

25. **1. CARPENTRY.**—For Sophomores, Juniors and Seniors may elect. Practice in the use of tools by exercises in bench work, repair of farm equipment and farm building construction.

2 2-hour laboratory periods, credit 2.

RURAL ENGINEERING DEPARTMENT.

26. **2. REPAIR OF FARM EQUIPMENT.**—For Sophomores, Juniors and Seniors may elect. Exercises in forge work, pipe fitting, soldering. Practice in the use of machinist's tools, such as file, cold chisel, drill press, taps and dies.

2 2-hour laboratory periods, credit 2.

RURAL ENGINEERING DEPARTMENT.

75. **1 FARM STRUCTURES.**—For Seniors, Juniors may elect. Study of the strength, durability and cost of building materials; water supply; lighting and heating systems for the farm; drawing plans, writing specifications and estimating the cost of buildings; concrete construction as applied to foundations, silos, tanks, posts, floors and walks.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor GUNNESS.

76. **1. FARM MECHANICS.**—For Seniors, Juniors may elect. A general study of the farm equipment; farm buildings, their location, plan and arrangement; water supply; sewage disposal; lighting and heating systems; farm power and farm machinery. Course 76 has been planned for the benefit of those students who want a general course in farm mechanics but cannot spend the time to take the two courses 75 and 78.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor GUNNESS.

77. **2. POWER MACHINERY.**—For Seniors, Juniors may elect. Steam and gasoline engines, refrigerating machinery, electric motors and dynamos. Practice in pipe fitting, soldering, babbiting and fitting bearings, lacing belts and packing valves. Course 77 is intended primarily for dairy students, but would be valuable to any man who would expect to use engines, pumps or electrical machinery.

2 class hours.

3 2-hour laboratory periods, credit 5.

Professor GUNNESS.

78. **3. FARM MACHINERY.**—For Seniors, Juniors may elect. Study of the care and operation of tillage, seeding, harvesting, pumping and spraying machinery; steam and gas engines. Special attention will be given to the use of power on the small farm. Practice in the adjustment of the various machines, babbiting and fitting bearings, lining shafts and pulleys, lacing belts, splicing rope and packing valves.

2 class hours.

3 2-hour laboratory periods, credit 5.

Professor GUNNESS.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

DIVISION OF HORTICULTURE.

Professor WAUGH.

(The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening and market gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.)

Elective Courses (General).

27. **3. NURSERY PRACTICE.**—For Sophomores, Juniors and Seniors may elect. This course treats of the fundamental methods of plant propagations by seeds, cuttings, budding, grafting, etc. Lectures and practicums.
2 class hours.

1 2-hour laboratory periods, credit 3.
Assistant Professor THOMPSON.

50. **1. PLANT MATERIALS.**—For Juniors, Seniors may elect. This course aims to make the student familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work and with the methods of propagating them.
3 class hours.

2 2-hour laboratory periods, credit 5.
Assistant Professor THOMPSON.

Prerequisite, Horticulture 27.

51. **3. PLANT MATERIALS.**—For Juniors, Seniors may elect. A continuation of Course 50, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions.
3 class hours.

2 2-hour laboratory periods, credit 5.
Assistant Professor THOMPSON.

Prerequisite, Horticulture 50.

75. **1. PLANT BREEDING.**—For Seniors and Graduate Students. (Not given in 1916-1917.) This course is designed to introduce advanced students to the best modern views of variation, heredity and evolution, and to the best methods of studying the phenomena found in these subjects. The principles educed apply to both animal breeding and plant breeding, but the laboratory work (of which there is considerable) is concerned chiefly with plant life. Some practice work in hybridization and selection is undertaken, and students are trained as far as possible in the practical application of those principles which have direct bearing on the breeding of plants and the cultivation of crops.
3 class hours.

2 2-hour laboratory periods, credit 5.

Prerequisite: Open only to students well prepared in agricultural or horticultural subjects.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

FLORICULTURE.

Associate Professor NEHRLING, MR. THURSTON.

Elective Courses.

50. **1. GREENHOUSE MANAGEMENT.**—For Juniors, Seniors may elect. This course is designed to familiarize students with the methods followed in the management of greenhouse crops. The students are instructed in the practical operations of watering, potting, fumigating, ventilating and in the methods of propagation of plants by seed and cuttings. They will also be expected to arrange their hours according to the needs of the work.

2 class hours.

1 4-hour laboratory period, credit 4.

Associate Professor NEHRLING and MR. THURSTON.

Prerequisite, Horticulture 27.

51. **2. GREENHOUSE MANAGEMENT.**—For Juniors, Seniors may elect. Continuation of Course 50. In addition, work in the use of cut flowers and plants in decorative work, the arrangement of flowers in baskets, designs, vases, table and home decorations will be considered.

2 class hours.

1 4-hour laboratory period, credit 4.

Associate Professor NEHRLING and MR. THURSTON.

Prerequisite, Floriculture 50.

52. **3. GREENHOUSE MANAGEMENT.**—For Juniors, Seniors may elect. A continuation of Courses 50 and 51.

2 class hours.

1 4-hour laboratory period, credit 4.

Associate Professor NEHRLING and MR. THURSTON.

Prerequisite, Floriculture 51.

53. **1. GREENHOUSE CONSTRUCTION.**—For Juniors, Seniors may elect. The location, arrangement, construction, cost, heating and ventilating of greenhouse structures; also the drawing of plans and drafting of specifications for commercial houses and private ranges. Such practical work as glazing, the construction of concrete benches and cold frames will be included in this course.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor NEHRLING and MR. THURSTON.

Prerequisite: Should be taken with Floriculture 50.

75. **1. COMMERCIAL FLORICULTURE.**—Seniors. A detailed study will be made of the methods cultural for greenhouse plants and cut flowers for wholesale and retail markets. The care and marketing of all florists' crops will also be considered. Assigned readings on these topics.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor NEHRLING.

Prerequisite, Floriculture 52.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

76. **3. COMMERCIAL FLORICULTURE.**—Seniors. As stated under Course 75.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor NEHRLING.

Prerequisite, Floriculture 75.

77. **2. CONSERVATORY WORK AND DECORATIVE PLANTS.**—Seniors. A study of the tropical and subtropical foliage and flowering plants used in conservatory work. Their arrangement and care will also be considered.

Assigned readings.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor NEHRLING.

Prerequisite, Floriculture 75.

78. **3. GARDEN FLOWERS AND BEDDING PLANTS.**—Seniors. This course aims to make the student familiar with those annuals, herbaceous perennials, bulbs and bedding plants used in landscape work. Their propagation, culture and uses will be considered. Assigned readings and field trips.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor NEHRLING and MR. THURSTON.

79. **3. SEMINAR.**—For Seniors majoring in Floriculture, only. Advanced study of subjects pertaining to commercial floriculture or private garden work. All students electing this work will be assigned a specific problem and will pursue study in these problems by reading and research. No regular lectures will be given, but seminars will be conducted each week. A satisfactory report of the results must be presented.

2 to 6 laboratory hours, not to exceed 3 credits.

Associate Professor NEHRLING and MR. THURSTON.

FORESTRY.

Professor CLARK.

Elective Courses.

50. **1. DENDROLOGY.**—For Juniors, Seniors may elect. During the first part of the term frequent field trips will be made to identify and study the habits of our native forest trees. Later, the classification, range, distribution, forest habits, quality, uses and identification of wood of the commercial timber trees of the United States will be studied. Lectures, recitations, laboratories or field work at option of instructor.

3 2-hour laboratory periods, credit 3.

Professor CLARK.

51. **2. WOOD TECHNOLOGY.**—For Juniors, Seniors may elect. A study of the commercial woods found in the lumber markets, methods of identification, uses, strength values, technical qualities, decay and methods of preservation.

1 class hour.

2 2-hour laboratory periods, credit 3.

Professor CLARK.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

52. **3. PRINCIPLES OF FORESTRY.**—For Juniors, Seniors may elect. A lecture course for the purpose of giving the students a general view of the whole field of forestry and what forestry attempts to accomplish and has accomplished. Not required of students who propose to major in forestry.
2 class hours. Credit 2.
Professor CLARK.

53. **3. SILVICULTURE.**—For Juniors, Seniors may elect. Factors influencing forest growth; forest types; silvicultural systems; care and protection of forests; forest description; forest nursery practice and forest planting.
1 class hour. 1 4-hour laboratory period, credit 3.
Professor CLARK.

Prerequisite, Forestry 50.

75. **1. FOREST MENSURATION.**—For Seniors, Juniors may elect. Methods of determining the volume of trees, logs and entire forests. Methods of computing volume tables, tree and forest growth and yield tables. Timber estimating.
3 class hours. 72 hours field work, credit 5.
Professor CLARK.

78. **3. SEMINAR.—REPORT.**—Seniors. This may involve research, laboratory or field work in the investigation of some subject, together with a review of the literature relating to it and an original written report evidencing the results. Subject to be chosen in conference with Professor Clark.
6 laboratory hours, credit 3.
Professor CLARK.

LANDSCAPE GARDENING.

Professor WAUGH, Assistant Professor HARRISON.

Elective Courses.

50. **1. ELEMENTS OF LANDSCAPE GARDENING.**—Juniors. Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected designs of leading landscape gardeners; grade design, road design and field work. Must be followed by Course 51.
2 2-hour laboratory periods,
2 3-hour laboratory periods, credit 5.
Professor WAUGH.

Prerequisites, Mathematics 25 and 26, Drawing 25, 26 and 27, Horticulture 27.

51. **2. ELEMENTS OF LANDSCAPE GARDENING.**—Juniors. As stated under Course 50.
3 3-hour laboratory periods, credit 4.
Assistant Professor HARRISON.

Prerequisite, Landscape Gardening 50.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:	
1 to 24 inclusive Freshmen	50 to 74 inclusive Juniors
25 to 49 " Sophomores	75 to 99 " Seniors

52. **3. GENERAL DESIGN.**—Juniors. Field notes; examination of completed works and those under construction; design of architectural details, planting plans, gardens, parks and private grounds; written reports on individual problems. Must be followed by Course 53.

2 2-hour laboratory periods,

2 3-hour laboratory periods, credit 5.

Assistant Professor HARRISON.

Prerequisites, Landscape Gardening 50 and 51, and either plant materials (Horticulture 50 and 51) or advanced mathematics.

53. **4. (Summer). GENERAL DESIGN.**—Juniors. As stated under Course 52.

120 laboratory hours, credit 5.

Assistant Professor HARRISON.

Prerequisite, Landscape Gardening 52.

75. **1. THEORY OF LANDSCAPE ART.**—For Seniors and Graduates. The general theory and applications of landscape study, including a brief history of the art.

3 class hours.

Credit 3.

Professor WAUGH.

76. **2. CIVIC ART.**—Seniors. The principles and applications of modern civic art, including city planning, city improvement, village improvement and rural improvement with special emphasis upon country planning. Must be followed by Course 77.

3 3-hour laboratory periods, credit 4.

Professor WAUGH.

Prerequisite, Landscape Gardening 53.

77. **3. CIVIC ART.**—Seniors. As stated under Course 76.

3 3-hour laboratory periods, credit 4.

Professor WAUGH.

Prerequisite, Landscape Gardening 76.

78. **3. ARCHITECTURE.**—Alternating with Course 79; given in 1916-1917. Juniors and Seniors. The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, conferences, practice in designing.

3 class hours.

Credit 3.

Assistant Professor HARRISON.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

79. 3. CONSTRUCTION AND MAINTENANCE.—Alternating with Course 78; given in 1917-18. Juniors and Seniors. Detailed instruction in methods of construction and planting in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc.

3 class hours.

Credit 3.

Assistant Professor HARRISON.

MARKET GARDENING.

Professor TOMPSON, Assistant Professor TOMSON.

Elective Courses.

50. 3. ELEMENTS OF MARKET GARDENING. Juniors, Seniors may elect. A study of the business of commercial vegetable growing to acquaint the student with the fundamental considerations of the business and a knowledge of the market garden crops. The study of the crops will consist of classroom, laboratory and field work dealing with propagation, cultivation and marketing. Text and reference books.

3 class hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor TOMSON.

75. 1. ELEMENTS OF MARKET GARDENING.—Seniors. A continuation of Market Gardening 50. A systematic study of types, varieties and strains of the leading vegetable crops, as well as a study of the problems of farm planning, irrigation, crop rotation, spraying, storage and methods of marketing and seed production. Text and reference books. Occasional seminars. Laboratory and field work.

3 class hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor TOMSON.

Prerequisite, Market Gardening 50.

76. 2. GREENHOUSE VEGETABLE GROWING.—Seniors. A study of the production of vegetables under glass as a business, briefly considering economic reasons for its development, progress, in methods, and management, and the present status of the industry. A study of vegetable forcing house construction, heating and greenhouse management, as applied to the leading greenhouse crops, lettuce, cucumbers and tomatoes with proportionate time given to the crops of lesser importance. Text and reference books and periodicals. Greenhouse work in actual production and management is a part of this course and the student must so arrange that he can give it adequate attention. Considerable Seminar work.

3 class hours.

2 2-hour laboratory periods, credit 5.

Assistant Professor TOMSON.

Prerequisite, Market Gardening 75.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:			
1 to 24 inclusive	Freshmen	50 to 74 inclusive	Juniors
25 to 49	Sophomores	75 to 99	Seniors

POMOLOGY.

Professor SEARS, Associate Professor CHENOWETH.

Elective Courses.

1. **1 and 2. POMOLOGY.**—Freshman. Given as part of the Freshman Agriculture and Horticulture. This course is designed to give the students a general introduction to Horticulture. It consists principally of laboratory work, such as judging fruits, vegetables, etc., both in the class room and in the orchard or field. Six weeks, part of class only, 1st Term; balance of class six weeks during the 2nd Term.

2 2-hour laboratory periods, credit 1.

POMOLOGY DEPARTMENT.

50. **1. PRACTICAL POMOLOGY.**—For Juniors, Seniors may elect. A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, culture of orchards, orchard fertilizers, cropping orchards, etc. Text and reference books; field and laboratory exercises.

2 class hours.

1 2-hour laboratory periods, credit 3.

Professor SEARS.

Prerequisite, Horticulture 27.

51. **2. PRACTICAL POMOLOGY.**—For Juniors, Seniors may elect. As stated under Course 50.

2 class hours.

1 2-hour laboratory period, credit 3.

Professor SEARS.

Prerequisite, Pomology 50.

52. **3. PRACTICAL POMOLOGY.**—For Juniors, Seniors may elect. As stated under Course 50.

2 class hours.

1 2-hour laboratory period, credit 3.

Professor SEARS.

Prerequisite, Pomology 51.

53. **4. (Summer). SMALL FRUITS.** For Juniors, Seniors may elect. The growing, harvesting, marketing, and storing of small fruits, including currants, gooseberries, and grapes, together with thinning, spraying, picking and marketing of tree fruits at the college orchards and in private commercial orchards.

120 laboratory hours, credit 5.

Associate Professor CHENOWETH.

75. **1. SYSTEMATIC POMOLOGY.**—Seniors. A study of the varieties of the different fruits and of nomenclature, with critical descriptions; special reference being given to relationships and classification. Text books, laboratory and field exercises.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor CHENOWETH.

Prerequisite, Pomology 52.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

76. **2. SYSTEMATIC POMOLOGY.**—Seniors. As stated under Course 75.
1 class hour. 2 2-hour laboratory periods, credit 3.
Associate Professor CHENOWETH.

Prerequisite, Pomology 75.

77. **1. COMMERCIAL POMOLOGY.**—Seniors only, majoring in Pomology.
The picking, handling, storing and marketing of fruits, including a discussion of storage houses, fruit packages, methods of grading and packing, manufacturing, etc. Especial emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of all the principal fruits, together with the manufacture of by-products.
1 class hour. 2 2-hour laboratory periods, credit 3.
Associate Professor CHENOWETH.

Prerequisite, Pomology 52.

78. **3. SPRAYING.**—Seniors. A study of (a) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material, formulas used, cost, tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small fruit plantations.
1 class hour. 2 2-hour laboratory periods, credit 3.
Professor SEARS.

Prerequisite, Pomology 52.

DRAWING.

MR. ROOT.

Elective Courses.

25. **1. FREE-HAND DRAWING.**—For Sophomores, Juniors and Seniors may elect. Lettering; free-hand perspective; sketching from type models, leaves, flowers and trees, houses, etc.; laying flat and graded washes in water colors; water color rendering of leaves, flowers and trees; conventional coloring and map rendering in water colors; conventional signs and mapping in ink.
3 2-hour laboratory periods, credit 3.
MR. ROOT.

26. **2. MECHANICAL DRAWING.**—For Sophomores, Juniors and Seniors may elect. Inking exercises; geometric problems; projection; intersections, isometric; shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry.
3 2-hour laboratory periods, credit 3.
MR. ROOT.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

27. **3. MECHANICAL DRAWING.**—For Sophomores, Juniors and Seniors may elect. As stated under Course 26.

3 2-hour laboratory periods, credit 3.

MR. ROOT.

Prerequisite, Drawing 26.

BOTANY.

Professor OSMUN, Associate Professor ANDERSON, Assistant Professor CLARK,
MR. McLAUGHLIN, MR. MARTIN, MR. DORAN.

Required Courses.

3. **3. MORPHOLOGY AND TAXONOMY OF THE HIGHER PLANTS (PHANEROGAMIA).**—Freshmen. Seeds and seedlings; types of leaves, stems, roots and flowers. Determination and naming of plants using Gray's "New Manual of Botany." An herbarium of 75 species of plants is required of each student.

1 class hour.

2 2-hour laboratory periods, credit 3.

Professor OSMUN, MR. McLAUGHLIN, MR. MARTIN, MR. DORAN.

25. **1. ANATOMY, PHYSIOLOGY AND ECOLOGY OF THE HIGHER PLANTS.**—Sophomores. Structure, functions, metabolism and environmental relations of seed plants.

1 class hour.

2 2-hour laboratory periods, credit 3.

Professor OSMUN, MR. McLAUGHLIN, MR. MARTIN, MR. DORAN.

Prerequisite, Botany 3.

Elective Courses.

26. **2. MORPHOLOGY AND TAXONOMY OF THE LOWER PLANTS (CRYPTOGAMIA).**—Sophomores. Systematic study of typical forms of bacteria, algae, fungi, lichens, mosses, ferns. (Courses 3, 25, and 26 constitute a general elementary course in botany, and are prerequisites of all subsequent work taken in the Department of Botany.)

1 class hour.

2 2-hour laboratory periods, credit 3.

Professor OSMUN, MR. McLAUGHLIN, MR. MARTIN, MR. DORAN.

Prerequisite, Botany 25.

50. **1. DISEASES OF CROPS.**—For Juniors, Seniors may elect. Laboratory and recitations devoted to diseases of the special crops related to the student's major. Arranged in sections for students specializing in (1) agronomy or market gardening; (2) floriculture or landscape gardening; (3) forestry or pomology; (4) entomology. Students may take the laboratory work in one, two or three sections. The laboratory work for students in entomology is general and includes the more important diseases studied in the other sections. The class is not sectioned for lectures, which are general.

1 class hour.

1, 2 or 3 2-hour laboratory periods, credits 2, 3 or 4.

Associate Professor ANDERSON, MR. McLAUGHLIN.

Prerequisite, Botany 26.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

51. 2. DISEASES OF CROPS.—For Juniors, Seniors may elect. As stated under Course 50.

1 class hour.

1, 2 or 3 2-hour laboratory periods, credits 2, 3 or 4
Associate Professor ANDERSON, MR. McLAUGHLIN.

Prerequisite, Botany 50.

52. 1. SYSTEMATIC MYCOLOGY.—For Juniors, Seniors may elect. Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection and preservation of fungi; study of systems of classification; collateral reading. A prerequisite of the senior course in plant pathology, but open to all.

1 class hour.

2 2-hour laboratory periods, credit 3.
Associate Professor ANDERSON.

Prerequisite, Botany 26.

53. 2. SYSTEMATIC MYCOLOGY.—For Juniors, Seniors may elect. As stated under Course 52.

1 class hour.

2 2-hour laboratory periods, credit 3.
Associate Professor ANDERSON.

Prerequisite, Botany 52.

54. 3. SYSTEMATIC MYCOLOGY.—For Juniors, Seniors may elect. As stated under Course 52.

1 class hour.

2 2-hour laboratory periods, credit 3.
Associate Professor ANDERSON.

Prerequisite, Botany 53.

55. 1. PLANT HISTOLOGY.—For Juniors, Seniors may elect. Comparative study of the tissues of plants; training in histological methods, including the use of precision microtomes, methods of killing, fixing, sectioning, staining and mounting; collateral reading and conferences. This course offers valuable training in preparation for further work in botany.

1 class hour.

2 2-hour laboratory periods, credit 3.
Professor OSMUN.

Prerequisite, Botany 26.

56. 2. PLANT HISTOLOGY.—For Juniors, Seniors may elect. As stated under Course 55.

1 class hour.

2 2-hour laboratory periods, credit 3.
Professor OSMUN.

Prerequisite, Botany 55.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

75. **1. PLANT PATHOLOGY.**—Seniors. Comprehensive study of diseases of plants; training in laboratory methods and technique, including culture work and artificial inoculation of hosts; miscellaneous diagnosis; study of literature and representative life-histories of pathogens. Prepares for civil service, experiment station and college work.

1 class hour.

4 2-hour laboratory periods, credit 5.

Professor OSMUN and Associate Professor ANDERSON.

Prerequisite, Botany 54.

76. **2. PLANT PATHOLOGY.**—Seniors. As stated under Course 75.

1 class hour.

4 2-hour laboratory periods, credit 5.

Professor OSMUN and Associate Professor ANDERSON.

Prerequisite, Botany 75.

77. **3. PLANT PATHOLOGY.**—Seniors. As stated under Course 75.

1 class hour.

4 2-hour laboratory periods, credit 5.

Professor OSMUN and Associate Professor ANDERSON.

Prerequisite, Botany 76.

78. **1. PLANT PHYSIOLOGY.**—Seniors. A general course dealing with such topics as absorption, nutrition, growth, and movements of plants; training in laboratory methods and the use of apparatus; collateral reading.

2 class hours.

3 2-hour laboratory periods, credit 5.

Assistant Professor CLARK.

Prerequisites, Botany 26 and Chemistry 51.

79. **2. PLANT PHYSIOLOGY.**—Seniors. As stated under Course 78.

2 class hours.

3 2-hour laboratory periods, credit 5.

Assistant Professor CLARK.

Prerequisite, Botany 78.

80. **3. PLANT PHYSIOLOGY.**—Seniors. As stated under Course 78.

2 class hours.

3 2-hour laboratory periods, credit 5.

Assistant Professor CLARK.

Prerequisite, Botany 79.

82. **2. CYTOLOGY AND EMBRYOLOGY.**—Seniors. Morphology and physiology of the cell; cell-division; embryonal development.

1 class hour.

2 2-hour laboratory periods, credit 3.

Assistant Professor CLARK.

Prerequisites, Botany 26 and 55.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

83. **3. CYTOLOGY AND EMBRYOLOGY.**—Seniors. As stated under Course 82.

1 class hour.

2 2-hour laboratory periods, credit 3.

Assistant Professor CLARK.

Prerequisite, Botany 82.

84. **2. SHADE TREE MANAGEMENT.**—Seniors. Not offered in 1916-17.

85. **3. SHADE TREE MANAGEMENT.**—Seniors. Not offered in 1916-17.

86. **1. SEMINAR.**—For Seniors and Graduate Students. Presentation and discussion of important current botanical papers. A major requirement. 1 class hour or 2 laboratory hours. Credit 1.

The DEPARTMENT.

87. **2. SEMINAR.**—For Seniors and Graduate Students. As stated under Course 86.

1 class hour or 2 laboratory hours.

Credit 1.

The DEPARTMENT.

88. **3. SEMINAR.**—For Seniors and Graduate Students. As stated under Course 86.

1 class hour or 2 laboratory hours.

Credit 1.

The DEPARTMENT.

GENERAL AND AGRICULTURAL CHEMISTRY.

Professor LINDSEY, Professor WELLINGTON, Professor CHAMBERLAIN, Associate Professor PETERS, Associate Professor ANDERSON, MR. SEREX, MR. ERICHSEN, MR. MACNEIL, MR. PERRY, MR. PHILLIPS.

[The course in chemistry aims to teach accurate observation, logical thinking and systematic and constant industry. It likewise aims to give those students following the several agricultural occupations, or who are preparing themselves for work as teachers and investigators in the other sciences, a knowledge of the subject sufficient to enable them to apply it in their various lines of work. Students taking all of the undergraduate courses and intending to follow chemistry as a vocation are prepared for positions as instructors in high schools and colleges in the agricultural experiment stations, the United States Department of Agriculture, as well as in fertilizer, cattle food, sugar and dairy industries. Students are encouraged to take especially graduate work leading to the degree of M.Sc., and to thus prepare themselves for advanced positions as teachers in the agricultural colleges, as research chemists, and likewise for the more responsible positions connected with the different agricultural industries of the country. A fuller knowledge of the course of instruction will be found by consulting the following outline.]

Required Courses.

1. **1. GENERAL CHEMISTRY.**—Freshmen. An introduction to the fundamental chemical laws, together with a study of the common acid-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemis-

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

try." This course is for those students who do not present chemistry for entrance, and who begin the subject in college.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor PETERS, MR. SEREX, MR. ERICHSEN and MR. PERRY.

2. **2. GENERAL CHEMISTRY.**—Freshmen. A continuation of Course 1. A study of metals and their compounds. The laboratory work is the same as described under Course 4.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor PETERS and Assistants.

3. **3. GENERAL CHEMISTRY.**—Freshmen. As stated under Courses 1 and 2.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor PETERS and Assistants.

4. **1. ADVANCED GENERAL CHEMISTRY.**—Freshmen. A review of the fundamental chemical laws, together with the common acid and base-forming elements and their compounds. Text-book, Kahlenberg's "Outlines of Chemistry." The laboratory work takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur and emulsions. In addition to these, preparations outlined in Blanchard's "Synthetic Inorganic Chemistry" are made.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor ANDERSON, MR. SEREX, MR. ERICHSEN, and MR. PHILLIPS.

Prerequisite, Presentation of Chemistry for entrance.

5. **2. INORGANIC AGRICULTURAL CHEMISTRY.**—Freshmen. A study of the chemical composition, properties and reactions of soils, fertilizers, fungicides and insecticides, and the common materials of construction, such as tile, brick, cements, paints, etc. Text-book, Fraps' "Principles of Agricultural Chemistry." The laboratory work is divided into three parts, as follows: (a) qualitative examination of soil, plant ash and superphosphate; (b) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, etc.; (c) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc.

2 class hours.

1 2-hour laboratory period, credit 3.

Associate Professor ANDERSON and Assistants.

Prerequisite, Chemistry 3 or 4.

6. **3. ORGANIC AGRICULTURAL CHEMISTRY.**—Freshmen. As stated in Course 30.

2 class hours.

1 2-hour laboratory period, credit 3.

Professor CHAMBERLAIN and Assistants.

Prerequisites, Chemistry 4 and 5.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

Elective Courses.

25. **1. QUALITATIVE ANALYSIS.—Basic.**—Sophomores. A course in the systematic analysis of metallic salts, presented from the ionic viewpoint. The student studies closely the tests used in the separation and identification of the metals; he then applies these tests to unknown mixtures. Text, Medicus' "Qualitative Analysis," with Böttger's "Qualitative Analysis" and Treadwell-Hall's "Qualitative Analysis" for reference. This Course should be taken, particularly, by all intending to follow chemistry as a vocation.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor ANDERSON and MR. PHILLIPS.

Prerequisite, Chemistry 3 or 6.

26. **2. QUALITATIVE ANALYSIS.—Acidic.**—Sophomores. A continuation of Course 25. A large part of the term is spent in the examination qualitatively of minerals and of agricultural products.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor ANDERSON and MR. PHILLIPS.

Prerequisite, Chemistry 25.

27. **3. QUANTITATIVE ANALYSIS.**—For Sophomores, Juniors and Seniors may elect. Instruction in this course includes the gravimetric and volumetric determinations of some of the commoner metals and non-metals in minerals and industrial products. Aside from teaching accurate observation and care in manipulation, it is intended for those who would learn the exact methods for determining the elements, particularly, in inorganic substances, and is the forerunner of other courses intended to fit men to become expert analysts. Talbot's "Quantitative Chemical Analysis" is used as a text.

1 class hour.

2 4-hour laboratory periods, credit 5.

Professor WELLINGTON, Associate Professor PETERS and MR. MACNEIL.

Prerequisite, Chemistry 25. Course 26 is prerequisite for those majoring in Chemistry.

30. **3. ORGANIC AGRICULTURAL CHEMISTRY.**—For Sophomores, Juniors and Seniors may elect. The course embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar, alcohol, wood pulp and paper. The treatment of the subject will be general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor CHAMBERLAIN and MR. PERRY.

Prerequisite, Chemistry 3 or 6.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

51. **1. ORGANIC CHEMISTRY.**—For Juniors, Seniors may elect. This course is designed especially: (1) for those who are looking forward to positions as chemists in agricultural colleges or experiment stations, the United States Department of Agriculture, or similar places, and who need a knowledge of chemistry for itself; and (2) for those who are expecting to enter like positions in other sciences, and who will use their knowledge of chemistry in a secondary way. It consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates, proteins, etc. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and thus for future work in agricultural chemical investigation. Those electing Course 51 are expected to elect Course 52.

5 class hours.

2 3-hour laboratory periods, credit 8.

Professor CHAMBERLAIN and Mr. PERRY.

Prerequisites, Chemistry 3 or 6, and Chemistry 27 for those majoring in Chemistry.

52. **2. ORGANIC CHEMISTRY.**—For Juniors, Seniors may elect. As stated under Course 51.

5 class hours.

2 3-hour laboratory periods, credit 8.

Prerequisite, Chemistry 51.

60. **1. ADVANCED QUANTITATIVE CHEMISTRY.**—For Juniors, Seniors may elect. Advanced work on subjects as stated under Course 27.

1 class hour.

1 4-hour laboratory period, credit 3.

Professor WELLINGTON, Associate Professor PETERS and Assistants.

Prerequisite, Chemistry 27.

61. **2. INSECTICIDE ANALYSIS.**—For Juniors, Seniors may elect. A study of methods for the analysis of Insecticides.

1 class hour.

1 4-hour laboratory period, credit 3.

Professor WELLINGTON, Associate Professor PETERS and Assistants.

Prerequisite, Chemistry 27.

62. **3. SOILS AND FERTILIZER ANALYSES.**—For Juniors, Seniors may elect. A study of methods for analyses of soils and fertilizers.

1 class hour.

2 4-hour laboratory periods, credit 5.

Professor WELLINGTON, Associate Professor PETERS and Assistants.

Prerequisite, Chemistry 27.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

65. **3. PHYSICAL CHEMISTRY.**—For Juniors, Seniors may elect. A résumé of general chemistry from the viewpoint of physical chemistry and the application of physical chemistry to agricultural chemistry.

3 class hours.

2 2-hour laboratory periods, credit 5.

Associate Professor ANDERSON and Mr. PHILLIPS.

Prerequisite, Chemistry 27.

76. **1. MILK AND BUTTER ANALYSIS.**—For Seniors, Juniors may elect. A study of chemical methods of analysis of milk and butter.

1 class hour.

2 4-hour laboratory periods, credit 5.

Professor PETERS and Assistants.

Prerequisite, Chemistry 27.

77. **2. CATTLE FEED AND WATER ANALYSIS.**—For Seniors, Juniors may elect. A study of methods of analysis of cattle feeds and water.

1 class hour.

1 4-hour laboratory period, credit 3.

Professor PETERS and Assistants.

Prerequisite, Chemistry 27.

80. **1. PHYSIOLOGICAL CHEMISTRY.**—Seniors. This course is intended to be supplementary to Courses 51 and 52, and Course 30. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 51 and 52, it will give acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 51 and 52 are built up in the living organism or are used as food by it. In the lectures the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory, experimental studies are made of the animal body and the processes and products of digestion, secretion and excretion. The course gives additional training in the chemical problems of agricultural experiment-station work, especially those connected with investigations in animal and plant nutrition. To those who will not take up scientific lines of work, but will follow practical agriculture, it will give an opportunity for a more detailed study of the chemistry and physiology of problems, which were treated generally in Course 30.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor CHAMBERLAIN and Mr. PERRY.

Prerequisites, Preferably Chemistry 30 or 51 and 52.

87. **3. HISTORY OF CHEMISTRY.**—Seniors. An exposition of the development of chemical knowledge from the earliest times to the present. Although the entire history will be included, the larger portion of it will receive only brief mention in order that the questions of vital interest in modern life and industry may be studied at greater length. Particular attention will be given to the questions of plant and animal industry. Chemists are strongly advised to take this course.

3 class hours.

Credit 3.

Professor WELLINGTON.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

90. 2. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS.

—Seniors. The student is given a problem to solve either in analytical chemistry or related to the agricultural industries. This is to acquaint him with the methods used in research and with the literature, and show him how to handle problems in this field of chemistry when occasion arises.

6 laboratory hours, credit 3.

Associate Professor PETERS.

91. 3. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS.

—Seniors. As stated in Course 90.

10 laboratory hours, credit 5.

Associate Professor PETERS.

Prerequisite, Chemistry 90.

92. 2. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.—Seniors. In this course, as in Courses 90 to 94, the student will be able to give his attention primarily to one line of chemical study. To those whose tastes and interests are in connection with the organic and physiological problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats, organic nitrogenous compounds in fertilizers and soils and their relation to plants, the commercial production of alcohol from agricultural products, digestion and dietary studies, the chemical study of dairy products, etc.

6 laboratory hours, credit 3.

Professor CHAMBERLAIN.

Prerequisites, Chemistry 51, 52 and 80.

93. 3. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.—Seniors. As stated under Course 92.

10 laboratory hours, credit 5.

Professor CHAMBERLAIN.

Prerequisite, Chemistry 92.

94. 3. SPECIAL WORK IN PHYSICAL CHEMISTRY.—Seniors. The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. Each student will select one line of work and follow it through the course, repeating some of the original work.

6 laboratory hours, credit 3.

Associate Professor ANDERSON.

Prerequisite, Chemistry 65.

95. 3. SPECIAL WORK IN PHYSICAL CHEMISTRY.—Seniors. As stated under Course 94.

10 laboratory hours, credit 5.

Associate Professor ANDERSON.

Prerequisite, Chemistry 94.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

ENTOMOLOGY.

Professor FERNALD, Professor CRAMPTON, Associate Professor GATES, DR. REGAN.

Elective Courses.

26. 2. GENERAL AND ECONOMIC ENTOMOLOGY.—For Sophomores, Juniors and Seniors may elect. Course 26 comprises a general introduction to the study of insects, including studies on their structure as applied to their identification; the principles of classification; a systematic examination of the different groups and of the most important economic insects of each group, including their life histories and habits, recognition of their work as shown in the collections, and methods for their control. The most important insecticides and their preparation and application are also treated. Students electing Course 26 are expected to take Course 27.

3 class hours.

Credit 3.

Professor FERNALD.

27. 3. GENERAL AND ECONOMIC ENTOMOLOGY.—For Sophomores, Juniors and Seniors may elect. A continuation of Course 26 with laboratory and field work on methods of collecting, preserving and studying insects and their work.

2 2-hour laboratory periods, credit 2.

Professor FERNALD.

Prerequisite, Entomology 26.

60. 3. BEEKEEPING.—For Juniors, Seniors may elect. This course comprises a general consideration of the biology of the honeybee and the elements of practical beekeeping. Some topics covered are: life history, general behavior and instincts, structure, products, relations of bees to plants, the honey flora. The course aims particularly to afford firsthand, practical experience with bees, to the end of enabling their proper maintenance for any purpose, horticultural, educational or apicultural. Bee diseases, a thorough understanding of which is fundamental, are emphasized. So far as possible the work is made individual in constructing materials and apparatus and in the manipulation of bees.

3 class hours.

2 2-hour laboratory periods, credit 5.

Associate Professor GATES.

Prerequisites, Entomology 26 and 27 desirable.

75. 3. FOREST AND SHADE-TREE INSECTS.—Seniors. A study of the insects injurious to forest and shade-trees, and of methods for their control, with laboratory and field work on these insects, and a study of what has been published about them.

1 class hour.

3 2-hour laboratory periods, credit 4.

Professor FERNALD.

Prerequisites, Entomology 26 and 27.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

76. 1. ADVANCED ENTOMOLOGY.—Seniors. This course is subdivided, the time spent on the various subdivisions differing somewhat according to the particular needs of those taking it; and it is to a large degree given in the form of individual instruction, special attention being paid to the pests attacking the particular crops in which the student is most interested. The student may specialize in fruit pests, market-garden pests, greenhouse pests, field crop pests, etc., to a large extent, in accordance with his plans for future work.

A. *Morphology*.—Careful studies of the structure of insects belonging to each of the large and more important orders, together with lectures on the subject, followed by the identification of insects of each of these groups and the study of the collections, to teach the use of the analytical tables and of structural characters in the determination of insects.

B. *Histology*.—Lectures on the internal anatomy and histology of the various organs, with particular reference to those affected by the various insecticides.

C. *Insecticides and Apparatus*.—Lectures on the chemistry, preparation and application of the different insecticides, their merits and defects; tests for detecting adulterations; comparative tests of nozzles and other apparatus; and a study of other methods of insect control, together with laboratory work.

D. *Coccidology*.—Lectures and laboratory work on methods of preserving, mounting and identifying scale insects, particular attention being given to those of greatest economic importance.

E. *Bibliography*.—Studies of the various entomological publications and of the methods of finding the literature on any insect.

F. *Special Studies*.—In these studies the insects most closely related to the future occupation of the student will receive attention. The results of these studies are brought together in the form of an essay or thesis; this will include all the essentials of what is known of the life history, habits and injuries caused by each insect studied, together with methods of treatment, and a list of the best articles found in the course of the work. Comstock's "Manual for the Study of Insects" is used in the laboratory work.

2 class hours.

3 2-hour laboratory periods, credit 5.

Professor FERNALD and Professor CRAMPTON.

Prerequisites, Entomology 26 and 27.

77. 2. ADVANCED ENTOMOLOGY.—Seniors. As stated in Course 76.

3 2-hour laboratory periods, credit 3.

Professor FERNALD and Professor CRAMPTON.

Prerequisite, Entomology 76.

78. 3. ADVANCED ENTOMOLOGY.—Seniors. As stated under 76.

1 class hour.

3 2-hour laboratory periods, credit 4.

Professor FERNALD and Professor CRAMPTON.

Prerequisite, Entomology 77.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

80. **3. ADVANCED BEEKEEPING.**—For Seniors, Juniors may elect. This course deals with the advanced and special problems of the beekeeper. Besides considering those difficulties which at present confront the industry, subjects necessarily of limited treatment in the previous course are expanded for the development of particular technique and manipulation. Apiary management, including the principles of queen rearing, are practiced. The course should further qualify for apicultural instruction and inspection service, affording familiarity with the special literature and methods needed in investigation and research. The policy of individual instruction is continued in so far as practicable. 2 class hours. 1 2-hour laboratory period, credit 3.

Associate Professor GATES.

Prerequisite, Entomology 60.

90. **2. EVOLUTION.**—For Seniors, Juniors may elect. In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the appearance of man; his future in the light of his past development; and the evolution of human institutions and ideas. Consideration is also given to the theories concerning the factors of evolution, the general problems of heredity and similar topics. The course closes with a brief discussion of the philosophical, moral and social aspects of the problems involved, and the influence of the idea of evolution upon modern thought. The lectures are supplemented by collateral reading; and a portion of the time is used for the purpose of demonstration, or discussion by the class. 3 class hours. Credit 3.

Professor CRAMPTON.

MATHEMATICS AND CIVIL ENGINEERING.

Professor OSTRANDER, Assistant Professor DUNCAN, Assistant Professor MACHMER, MR. HAZELTINE.

Required Courses.

1. **1. HIGHER ALGEBRA.**—Freshmen. A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Reitz and Crathorne's "College Algebra."

5 class hours.

Credit 5.

Assistant Professor DUNCAN, Assistant Professor MACHMER and MR. HAZELTINE.

2. **2. HIGHER ALGEBRA.**—As stated under Course 1.

2 class hours.

Credit 2.

Assistant Professor DUNCAN, Assistant Professor MACHMER and MR. HAZELTINE.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

3. **3. SOLID GEOMETRY.**—Freshmen. Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Wentworth and Smith's "Solid Geometry." Required unless accepted for admission.

3 class hours.

Credit 3.

Assistant Professor DUNCAN, Assistant Professor MACHMER and Mr. HAZELTINE.

5. **2. PLANE TRIGONOMETRY,** (in charge of Department of Physics).—Freshmen. The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry."

3 class hours.

Credit 3.

Professor HASBROUCK and Assistant Professor ROBBINS.

6. **3. MENSURATION AND COMPUTATION.**—Freshmen. The course includes a review of methods of computation, with special emphasis on short and abbreviated processes, together with methods of checking computations and of forming close approximations; use of slide rule. Also the graph, mensuration of plane and solid figures, weights and measures and elementary mechanism. Numerous practical problems are selected from such subjects as the following: the mathematics of woodworking; rough lumber; general construction; forestry methods in heights of trees; pulleys, belts and speeds; power and its transmission; dairying; agronomy; computation of areas from simple measurements.

2 class hours.

Credit 2.

Assistant Professor MACHMER, Assistant
Professor DUNCAN and Mr. HAZELTINE.

Elective Courses.

26. **2. PLANE SURVEYING.**—For Sophomores, Juniors and Seniors may elect. The elements of the subject, including the adjustment and use of the usual instruments. Text-book and lectures.

2 class hours.

Credit 2.

Professor OSTRANDER, Assistant Professor DUNCAN,
Assistant Professor MACHMER and Mr. HAZELTINE.

27. **3. PLANE SURVEYING.**—For Sophomores, Juniors and Seniors may elect. As stated under Course 26. Includes field work.

3 2-hour laboratory periods, credit 3.

Professor OSTRANDER, Assistant Professor DUNCAN,
Assistant Professor MACHMER and Mr. HAZELTINE.

Prerequisite, Mathematics 26.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

50. **1. ANALYTIC GEOMETRY.**—For Juniors, Seniors may elect. A discussion of the geometry of the line, the circle of conic sections and of the higher plane curves. Fine and Thompson's "Coordinate Geometry."
3 class hours. Credit 3.

Assistant Professor DUNCAN.

Prerequisites, Mathematics 1, 2, 3 and 5.

51. **2. DIFFERENTIAL AND INTEGRAL CALCULUS.**—For Juniors, Seniors may elect. A first course in the subject, with some of the more important applications. Davis's "Differential and Integral Calculus."
5 class hours. Credit 5.

Assistant Professor DUNCAN.

Prerequisites, Mathematics 1, 2, 3 and 5.

52. **3. INTEGRAL CALCULUS.**—For Juniors, Seniors may elect. A continuation of Course 51.
5 class hours. Credit 5.

Assistant Professor DUNCAN.

Prerequisite, Mathematics 51.

53. **2. ELEMENTARY STRUCTURES.**—For Juniors, Seniors may elect. An elementary course in roofs and bridges. Text-book and lectures.
3 class hours. 1 2-hour laboratory period, credit 4.

Professor OSTRANDER.

75. **1. HYDRAULICS AND SANITARY ENGINEERING.**—For Seniors, Juniors may elect. Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Text-book and lectures.
5 class hours. Credit 5.

Professor OSTRANDER.

76. **1. MATERIALS OF CONSTRUCTION, FOUNDATIONS AND MASONRY CONSTRUCTION.**—For Seniors, Juniors may elect. Text-book and lectures.
4 class hours. 1 2-hour laboratory periods, credit 5.

Professor OSTRANDER.

77. **2. ROADS AND RAILROADS.**—For Seniors, Juniors may elect. Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Text-book and lectures.
3 class hours. Credit 3.

Professor OSTRANDER.

78. **3. ROADS AND RAILROADS.**—For Seniors, Juniors may elect. As stated under Course 77.

3 2-hour laboratory periods, credit 3.

Professor OSTRANDER.

Prerequisite, Mathematics 77.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

79. **1. APPLIED MECHANICS.**—Seniors. A course in applied mechanics, based on the calculus, with problems. Text-books and lectures.
5 class hours.

Credit 5.

Professor OSTRANDER.

Prerequisite, Mathematics 51.

MICROBIOLOGY.

Professor MARSHALL, Associate Professor VANSUCHTELEN, MR. ITANO, MR. AVERY

(Courses 50 and 51 are especially adapted to those who wish a general comprehensive, although elementary, survey of agricultural microbiology).

Elective Courses.

50. **1 and 3. INTRODUCTION AND GENERAL MICROBIOLOGY.**—For Juniors, Seniors may elect. A review of the field of Microbiology as a whole, with special reference to Hygienic Microbiology, will constitute this course. It will be taught by means of lectures, demonstrations and text-books. Although desirable, it will not be required as a prerequisite to all courses that follow, and may be taken along with Course 51.
5 class hours.

Credit 5.

MICROBIOLOGY DEPARTMENT.

51. **1. 2 and 3. MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.**—For Juniors, Seniors may elect. Types of micro-organisms, technic of handling, methods of culture and functions of micro-organisms are considered. This course is elementary and fundamental to all applied and special microbiological studies, and therefore is made a prerequisite to all courses following. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

52. **3. ADVANCED MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY.**—For Juniors, Seniors may elect. The purpose of this course is to prepare the student for a more intimate knowledge of microbiological agricultural problems. To accomplish this object it is necessary to provide more advanced technic and methods of culture, together with a more extensive knowledge of micro-organisms and their functions. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisites, Microbiology 50 and 51.

75. **2. AGRICULTURAL MICROBIOLOGY.**—For Seniors, Juniors may elect. This general comprehensive course is designed to cover in an elementary manner those subjects only which confront the student of general agriculture,—the microbiological features of air, water, sewage, soil, dairy, fermentations, food,

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Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

vaccines, antisera, microbial plant infections, methods and channels of infections, immunity and susceptibility, microbial infections of man and animals, methods of control or sanitary and hygienic practices. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisite, Microbiology 51.

76. **3. AGRICULTURAL MICROBIOLOGY.**—For Seniors, Juniors may elect. As stated under Course 75. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisites, Microbiology 52 and 75.

80. **2. SOIL MICROBIOLOGY.**—For Seniors, Juniors may elect. Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth, food, reaction, temperature, moisture and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisite, Microbiology 51.

81. **1. HYGIENIC MICROBIOLOGY.**—For Seniors, Juniors may elect. An attempt will be made to select for this course certain material which should be the possession of every individual, and which is basic to public hygiene and sanitation, as applied to man and animals. The microbiology of water supplies, food supplies, vaccines, antisera or antitoxins; the channels by which micro-organisms enter the body, the influence of body fluids and tissues upon them, body reactions with micro-organisms (susceptibility and immunity); the micro-organisms of some of the most important infectious diseases, methods of control including disinfectants and disinfection, antiseptics, antiseptis and asepsis will be treated. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisites, Microbiology 50 and 51.

82. **1. DAIRY MICROBIOLOGY.**—For Seniors, Juniors may elect. Special emphasis will be placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bac-

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Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

terial content of butter; a passing survey of the microbiology of cheeses; a study of special dairy products, as ice cream, condensed milk, artificial milk drinks (the products of microbial actions), represents a list of topics considered.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisites, Microbiology 51, Dairying 51.

83. **1. FOOD MICROBIOLOGY.**—For Seniors, Juniors may elect. A study of food preservation by means of drying, canning, refrigerating and addition of chemicals will be pursued. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., will be examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased foods, will receive consideration. Contamination of food supplies by means of water, handling, exposure, diseased persons, etc., is of especial significance and will be demonstrated by laboratory exercises. One hour will be scheduled.

10 laboratory hours, credit 5.

MICROBIOLOGY DEPARTMENT.

Prerequisite, Microbiology 51.

PHYSICS.

Professor HASBROUCK, Assistant Professor ROBBINS, MR. THOMPSON.

(The fundamental and basic importance of the laws and phenomena of physics makes necessary no explanation of the introduction of this subject into the curriculum of an agricultural college. The logical development of the subject emphasizes the importance of physics as a science in itself. Special emphasis is laid, however, on the correlation of the principles studied with the sciences of agriculture, botany, chemistry, zoology, thus furnishing an extra tool by use of which the student's work in all the subjects may be more effective).

Required Courses.

25. **1. GENERAL PHYSICS.**—Sophomores. Mechanics of Solids and Fluids. This course includes statics, with equilibrium of rigid bodies, work, energy and friction; kinetics, considering rectilinear motion and motion in a curved path; harmonic motion; rotation of rigid bodies, including kinematics of rotation; liquids and gases, with properties of fluids at rest and in motion; properties of matter and its internal forces, including elasticity, capillarity, surface tension.

3 class hours.

1 2-hour laboratory period, credit 4.

Professor HASBROUCK, Assistant Professor ROBBINS, MR. THOMPSON.

26. **2. ELECTRICITY AND MAGNETISM.**—Sophomores. The work in electricity includes such subject matter as magnetism, electrostatics, electric currents with their production, chemical, heating and mechanical effects; battery cells, measurement of voltage, current flow and resistance, motors and generators.

2 class hours.

1 2-hour laboratory period, credit 3.

Assistant Professor ROBBINS and MR. THOMPSON.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

Elective Courses.

27. **3. HEAT AND LIGHT.**—For Sophomores, Juniors and Seniors may elect. Thermometry, expansion, colorimetry and specific heat, transmission of heat, changes of state, radiation and absorption. Wave theory of light, optical instruments, analysis of light, color, interference, diffraction, polarization.

4 class hours. 1 2-hour laboratory period, credit 5.

Professor HASBROUCK, Assistant Professor ROBBINS and MR. THOMPSON.

50. **1. ELECTRICITY, HEAT AND LIGHT.**—For Juniors, Seniors may elect.

1 class hour. 2 2-hour laboratory periods, credit 3.

Assistant Professor ROBBINS.

51. **2. ELECTRICITY, HEAT AND LIGHT.**—For Juniors, Seniors may elect. Continuation of Course 50.

1 class hour. 2 2-hour laboratory periods, credit 3.

Assistant Professor ROBBINS.

Prerequisite, Physics 50.

52. **3. ELECTRICITY, HEAT AND LIGHT.**—For Juniors, Seniors may elect. Continuation of Courses 50 and 51.

1 class hour. 2 2-hour laboratory periods, credit 3.

Assistant Professor ROBBINS.

Prerequisite, Physics 51.

VETERINARY SCIENCE.

Professor PAIGE, Associate Professor GAGE.

(The courses in veterinary science have been arranged to meet the needs of students who propose following practical agriculture, and of prospective students of human and comparative medicine.)

Elective Courses.

50. **1. VETERINARY HYGIENE AND STABLE SANITATION.**—For Juniors, Seniors may elect. This course is intended to familiarize the student with the relation of water, food, air, light, ventilation, care of stables, disposal of excrement, individual hygiene, etc., to the prevention of disease in farm animals.

5 class hours.

Credit 5.

Professor PAIGE.

51. **2. GENERAL VETERINARY PATHOLOGY, MATERIA MEDICA AND THERAPEUTICS.**—For Juniors, Seniors may elect. In this course such fundamental and general pathological conditions are studied as inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the diagnosis, prevention and treatment of disease. The course in pathology is followed by one in materia medica and therapeutics, dealing with the origin, preparation,

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Numbering of Courses:

1 to 24 inclusive Freshmen
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50 to 74 inclusive Juniors
75 to 99 " Seniors

pharmacology, pharmacy, administration and therapeutic use of the more common drugs. Poisonous plants and symptoms and treatment of plant poisoning are also considered.

5 class hours.

Credit 5.

Professor PAIGE.

75. 1. COMPARATIVE (VETERINARY) ANATOMY.—For Seniors, Juniors may elect. The anatomy of the horse is studied in detail, and that of other farm animals compared with it where differences exist. This course is essential for those students wishing to elect Course 76.

5 class hours.

Credit 5.

Professor PAIGE.

76. 2. THEORY AND PRACTICE OF VETERINARY MEDICINE; GENERAL, SPECIAL AND OPERATIVE SURGERY.—For Seniors, Juniors may elect. A course intended to familiarize the student with the various medical and surgical diseases of the different species of farm animals. Particular attention is given to diagnosis and first-aid treatment. The student is taught the technic of simple surgical operations that can with safety be performed by the stock owner. Lectures, demonstrations and practice. This course should be taken in conjunction with Course 51.

5 class hours.

Credit 5.

Professor PAIGE.

Prerequisite, Veterinary 75.

78. 1. ESSENTIALS OF GENERAL PATHOLOGY.—For Seniors, Juniors may elect. This course is planned to introduce the student to some of the essential anatomical, histological and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis will be considered in the laboratory. The various chemical and biological reactions and tests will be presented from the standpoint of pure science, showing applications of chemistry and biology. The course will serve to liberally educate and stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration and laboratory work.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

79. 2. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.—For Seniors, Juniors may elect. This is a continuation of Course 78, and is devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease will be considered.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

Prerequisite, Veterinary 78.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

80. **3. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.**—For Seniors, Juniors may elect. As stated in Courses 78 and 79.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

Prerequisite, Veterinary 79.

85. **1. AVIAN PATHOLOGY.**—For Seniors, Juniors may elect. A course in poultry diseases. The object of this course is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. The work will consist of a systematic study of the diseases of the alimentary tract, liver and abdominal region, followed by a study of the diseases of the respiratory system, circulation and kidneys. The important disease-producing external and internal parasites will be considered; also diseases of the skin and reproductive organs. Lectures and demonstrations.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

86. **2. AVIAN PATHOLOGY.**—For Seniors, Juniors may elect. As stated under Course 85, also devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases will be considered and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations and laboratory work.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

Prerequisite, Veterinary 85.

87. **3. AVIAN PATHOLOGY.**—For Seniors, Juniors may elect. As stated under Courses 85 and 86.

2 3-hour laboratory periods, credit 3.

Associate Professor GAGE.

Prerequisite, Veterinary 86.

ZOOLOGY AND GEOLOGY.

Associate Professor GORDON.

ZOOLOGY.

Required Courses.

25. **1. GENERAL ZOOLOGY.**—Sophomores. This course gives an outline of the underlying principles of Zoölogy and an introduction to animal structure.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor GORDON and Assistant.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

Elective Courses.

27. 3. ELEMENTS OF MAMMALIAN ANATOMY.—For Sophomores, Juniors and Seniors may elect. This course is offered as a preparation for work in histology, embryology, general vertebrate zoölogy, etc. It also deals briefly with the essentials of physiology. The course is open to prospective students in physiological chemistry, microbiology, animal husbandry, veterinary sciences, etc.
1 class hour. 2 2-hour laboratory periods, credit 3.

Associate Professor GORDON and Assistant.

Prerequisite, Zoölogy 25.

50. 1. SYNOPTIC INVERTEBRATE ZOÖLOGY.—For Juniors, Seniors may elect. This course gives a synopsis of the distinguishing characters of the different phyla and classes of invertebrates.
1 class hour. 2 2-hour laboratory periods, credit 3.

Associate Professor GORDON and Assistant.

Prerequisite, Zoölogy 25.

51. 2. SYNOPTIC INVERTEBRATE ZOÖLOGY.—For Juniors, Seniors may elect. Continuation of Course 50.
1 class hour. 2 2-hour laboratory periods, credit 3.

Associate Professor GORDON and Assistant.

Prerequisite, Zoölogy 50.

52. 3. SYNOPTIC INVERTEBRATE ZOÖLOGY.—For Juniors, Seniors may elect. Continuation of Courses 50 and 51.
1 class hour. 2 2-hour laboratory periods, credit 3.

Associate Professor GORDON and Assistant.

Prerequisite, Zoölogy 51.

53. 1. ELEMENTS OF MICROSCOPIC TECHNIQUE.—For Juniors, Seniors may elect. This course gives methods of preparing material for microscopic examination.

3 2-hour laboratory periods, credit 3.
The DEPARTMENT.

Prerequisite, Zoölogy 25.

54. 2. ELEMENTS OF HISTOLOGY.—For Juniors, Seniors may elect. This course involves preparation and study of normal animal tissues.

3 2-hour laboratory periods, credit 3.
The DEPARTMENT.

Prerequisites, Zoölogy 27 and 53.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

55. **3. ELEMENTS OF HISTOLOGY.**—For Juniors, Seniors may elect. Continuation of Course 54.

3 2-hour laboratory periods, credit 3.
The DEPARTMENT.

Prerequisite, Zoölogy 54.

75. **1. ADVANCED ZOÖLOGY.**—For Seniors and Graduate Students. Students who are adequately prepared may elect special work in general embryology, vetebrate embryology, comparative invertebrate zoölogy, comparative vertebrate zoölogy, etc.

2 class hours.

3 2-hour laboratory periods, credit 5.
The DEPARTMENT.

Prerequisites: Depending on elective.

76. **2. ADVANCED ZOÖLOGY.**—For Seniors and Graduate Students. As stated under Course 75.

2 class hours.

3 2-hour laboratory periods, credit 5.
The DEPARTMENT.

Prerequisites: Depending on elective.

77. **3. ADVANCED ZOÖLOGY.**—For Seniors and Graduate Students. As stated under Courses 76.

2 class hours.

3 2-hour laboratory periods, credit 5.
The DEPARTMENT.

Prerequisites: Depending on elective.

Foot Note: The work offered in Zoölogy 50, 51, 52, 75, 76 and 77 may apply on a minor for the degrees of Master of Science or Doctor of Philosophy.

GEOLOGY.

Required Courses.

2. **2. AGRICULTURAL GEOLOGY.**—Freshmen. The elements of geology in their application to agriculture.

2 class hours.

Credit 2.
Associate Professor GORDON.

Elective Courses.

27. **3. GENERAL GEOLOGY.**—For Sophomores, Juniors and Seniors may elect. Rock-forming minerals; rock types; rock weathering; dynamical, structural and surface geology. Lectures, map and field work.

3 class hours.

2 2-hour laboratory periods, credit 5.
Associate Professor GORDON.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

DIVISION OF THE HUMANITIES.

Professor SPRAGUE.

ECONOMICS AND SOCIOLOGY.

Professor SPRAGUE.

(The courses in economics and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.)

Elective Courses.

26. 2. ANTHROPOLOGY; THE HISTORY OF HUMAN CIVILIZATION.—For Sophomores, Juniors and Seniors may elect. The evolutionary origin and history of man; characteristics of primitive men, departure from the animal status, and the beginnings of civilization; development of industries, arts and sciences; the growth of languages, warfare, migrations and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern conditions; characteristics of the leading races of the world. These topics will constitute the subject-matter of the course. Library readings, text-book and lectures.

5 class hours.

Credit 5.

Professor SPRAGUE.

50. 1. INDUSTRIAL PROBLEMS.—For Juniors, Seniors may elect. This is a course in the most important industrial problems of the day, covering the methods of organizations of labor and capital, systems of industrial remuneration, means of securing industrial peace, legal status of labor unions and their activities, protective legislation for workmen and employers, the problems of immigration, the sweated industries, prison labor, child labor and industrial education. Text-book, with collateral readings, lectures and discussion.

5 class hours.

Credit 5.

Professor SPRAGUE.

51. 2. POLITICAL ECONOMY.—For Juniors, Seniors may elect. An introductory course which takes up the study of the nature and scope of economics, the evolution and organization of the present economic system, and the fundamental principles of production, exchange and consumption. The class will study and discuss such topics as wealth, value, capital, interest, profits, wages and labor, tariffs, trusts, etc. Debates on current economic problems will be organized in the class. Text-book, library readings, lectures and discussions.

5 class hours.

Credit 5.

Professor SPRAGUE.

52. 3. PUBLIC FINANCE, MONEY AND BANKING.—For Juniors, Seniors may elect. This course follows Economics 51. It will take up taxation and the various systems for collecting public revenue in Europe and America, with the problems involved; the history of money and the systems of banking and finance now in operation; the cause and problems of economic crises and depressions; the currency problems of the United States. Readings, lectures and discussions.

5 class hours.

Credit 5.

Professor SPRAGUE.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

75. 1. SOCIAL INSTITUTIONS AND SOCIAL PROBLEMS.—For Seniors, Juniors may elect. This course is devoted to the study of the social institutions, such as the family, the church, State and property; and to such current social problems as divorce, race suicide, crime and prison reform, poverty and its relief. Considerable time is given to the study of eugenics in its social significance and possibilities. The correctional and charitable institutions of Massachusetts are studied in some detail. The later weeks of the term are devoted to a short introduction to sociological theory. Readings, lectures, discussions.
5 class hours.

Credit 5.

Professor SPRAGUE.

76. 2. MODERN SOCIAL REFORM MOVEMENTS.—For Seniors, Juniors may elect. The history of property and its vital issues in modern times; the socialistic systems, anarchy and communism; systems of workingmen's insurance in Europe and America, and other methods of relief from the chances of life; educational reforms, in process, to meet the demands of a new age, and legislative remedies for the evils of social change and maladjustment; the crisis of Christianity under modern capitalized industrialism. These topics indicate the nature of the subjects studied. This course is arranged to follow Economics 75.
5 class hours.

Credit 5.

Professor SPRAGUE.

HISTORY AND GOVERNMENT.

Elective Courses.

50. 1. ELEMENTS OF POLITICAL SCIENCE.—For Juniors, Seniors may elect. Nature and scope of political science; origin and evolution of the State; systems of government in the principal European States; organization and working of the national and of the State governments of the United States; relation of government to political parties and to public opinion; the functions of government as related to labor and commerce. (Withheld in 1915-16).
3 class hours.

Credit 3.

51. 2. LOCAL POLITICAL INSTITUTIONS.—For Juniors, Seniors may elect. A comparative study of the organization, functions and achievements of country and city groups, especially as these are concerned with such matters as taxation, finance, licenses, franchises, public ownership, highways, transportation and communication, water supply, fire protection, public lighting, markets, food inspection, garbage and sewage disposal, infectious diseases, housing conditions, police force, parks and playgrounds, libraries, schools, care of dependents. (Not given in 1915-16).
3 class hours.

Credit 3.

75. 2. THE HISTORY OF NEW ENGLAND.—For Seniors, Juniors may elect. This course, treating New England as a unit, aims to give a survey of its

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Numbering of Courses:

1 to 24 inclusive Freshmen
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50 to 74 inclusive Juniors
75 to 99 " Seniors

political, religious and economic history; to trace the development of its institutions, the growth of its industries, and its influence in national politics and upon the newer sections of the United States. Assigned readings and themes.
3 class hours. Credit 3.

76. **3. THE HISTORY OF IDEALS.**—For Seniors, Juniors may elect. This course treats history from the idealistic rather than from the economic point of view. It attempts to define the great ideals which have impelled some of the most important social, political, esthetic, scientific, ethical and religious movements of medieval and modern history, and to trace the causes of the success or failure of the movements to which these ideals have led. Christianity, including monasticism, modern Catholicism and Protestantism; medieval art and architecture; the modern scientific movement; and social and political democracy will be treated historically from this point of view. (Withheld in 1915-16). Lectures and reading.
3 class hours. Credit 3.

LANGUAGES AND LITERATURE.

Professor LEWIS, Associate Professor NEAL, Associate Professor ASHLEY, Associate Professor MACKIMMIE, Assistant Professor SMITH, Assistant Professor PRINCE, MISS GOESSMANN, MR. HARMOUNT, MR. JULIAN, MR. RAND.

ENGLISH.

Required Courses.

1-1. 2-2. and 3-3. **ENGLISH.**—Freshmen. Composition. Recitations, laboratory practice and lectures; theme writing and conferences. Text-book and laboratory manual, Neal's "Thought-Building in Composition."
3 class hours each term. Credit 3 each term.

Assistant Professor SMITH, Assistant Professor PRINCE and MR. RAND.

25-1. 26-2. and 27-3. **ENGLISH.**—Sophomores. A general reading course in English literature.
2 class hours each term. Credit 2 each term.

Professor LEWIS and MISS GOESSMANN.

Prerequisites, English 1, 2 and 3.

Elective Courses in English Language and Literature.

(The elective courses in English fall into two groups. Both groups are intended to increase the student's appreciation of literature as a means to enjoyment, education and spiritual growth. Group one (Courses 50, 51, 52, 53, 54 and 55) will, besides introducing the student to individual writers, emphasize the life and thought of the times, political, economic and social, in order that the student may realize literature as the expression of individual genius representing (by leading it or summarizing it) the thought and spirit of a period or a social unit. Group two (Courses 75, 77, 79 and 80) will tend more to emphasize form-characteristics, artistic quality or historical development of literary types, or individual great writers. Courses 50, 51, 55, 75, 79 and 80 are offered in 1916-17; courses 52, 53, 54, 55, 77 and 80 are offered in 1915-16 and 1917-18.)

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

50. 1. ENGLISH WRITERS AND THOUGHT.—Alternates with Course 53. *Verse from 1744 to 1832* (1916, 1918).—For Juniors, Seniors may elect. A course in history, appreciation and understanding. Between the years named we see the rapid decline in formalism and a rapid increase of originality, freedom and emotional quality in literature (romanticism), accompanying the appearance in England of liberalism, industrial development, more general education and the spread of the ideals of democracy, and influenced also by Continental thought, especially the spirit of the French Revolution. This is the time in which England entered definitely upon that period of modern struggle, change and reorganization which is to be seen still continuing in contemporary affairs. Some of the writers belonging to it are Thomson, Collins, Gray and Cowper, Goldsmith, Chatterton, Blake, Crabbe, Burns, Coleridge, Wordsworth, Keats, Shelley, Scott and Byron.

3 class hours.

Credit 3.

Assistant Professor SMITH.

51. 2. ENGLISH WRITERS AND THOUGHT.—Alternates with Course 54. *Nineteenth Century Verse* (1915, 1917).—Juniors, Seniors may elect. In general conception this course is like Course 50, which see. It begins with literature under the economic and social conditions of Victorian England, involving the advance of democracy, the spread of knowledge and culture, the advance of science, and the increase of industrialism, accompanied somewhat by materialism. The literature of the period takes new forms and directions; among its characteristics is an earnest endeavor to interpret ideals to a vastly increased and incompletely prepared reading public ("social service"). Tennyson, Browning, Mrs. Browning, Arnold, the Rossettis and Morris, Swinburne and Clough are among its noteworthy authors. Contemporary verse-writers will receive some notice.

3 class hours.

Credit 3.

Professor LEWIS.

52. 3. ENGLISH WRITERS AND THOUGHT.—*From Milton to Pope* (1915-17).—For Juniors, Seniors may elect. A survey course. It begins with a brief review of the Elizabethan period, and then considers the period of Milton (Caroline literature—Puritanism, the civil wars, Cromwell and the Protectorate) followed by the rapidly changing political and social conditions of the Restoration and then of the Revolution, ending with the Augustan age and Pope, and the temporary predominance of classicism and the intellectual instead of emotional qualities in literature. It will, however, emphasize the leading writers of the periods, including Bacon, Milton, Dryden, Addison and the essayists, Swift and Pope. Much of the literature of these times is closely associated with interesting and most important events in English political, religious and social history that introduce and explain the later modern periods. Given every second year.

3 class hours.

Credit 3.

Assistant Professor SMITH.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

53. 1. ENGLISH WRITERS AND THOUGHT.—Alternating with Course 50. *Prose from 1744 to 1832* (1915, 1917). For Juniors, Seniors may elect. A course in English prose paralleling Course 51, which see. Some of the writers belonging to the period are Johnson, Sterne, Goldsmith, Burke, Miss Burney, Coleridge, Landor, Lamb, DeQuincey and Hazlitt. The political essayists and the reviews will receive attention, but prose writers whose principal work was done in the novel will not be emphasized (see Course 75).

3 class hours.

Credit 3.

Assistant Professor SMITH.

54. 3. ENGLISH WRITERS AND THOUGHT.—Alternating with Course 51. *Nineteenth Century Prose* (1916, 1918). For Juniors, Seniors may elect. This course parallels Course 51, which see. Among the writers discussed will be Macaulay, Carlyle, Ruskin, Newman, historians (*e. g.*, Pater, Arnold and Symonds). Fiction writers are given little attention (see Course 75), but contemporary writers of other prose will be given some notice.

2 class hours.

Credit 2.

Professor LEWIS.

55. 2. AMERICAN WRITERS AND THOUGHT.—For Juniors, Seniors may elect. Intended to give a general survey of literature in America, especially in the nineteenth century, with an introduction to the work of the best-known writers, and with especial attention to the relations between national life and history and national thought as expressed in literature. The usual authors—Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Parkman, Lowell, Holmes, Whitman, Lanier—will be discussed, and attention will be given to southern and western authors. Present writers and tendencies will also receive some notice.

3 class hours.

Credit 3.

Assistant Professor PRINCE.

56. 3. AMERICAN WRITERS AND THOUGHT.—For Juniors, Seniors may elect. As stated under Course 55.

2 class hours.

Credit 2.

Assistant Professor PRINCE.

60. 1. THE LITERATURE OF RURAL LIFE.—For Juniors, Seniors may elect. A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities.

3 class hours.

Credit 3.

MISS GOESSMANN.

61. 2. THE LITERATURE OF RURAL LIFE.—For Juniors, Seniors may elect. As stated under Course 60.

2 class hours.

Credit 2.

MISS GOESSMANN.

Prerequisite, English 60.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

75. **3. PROSE FICTION.**—Alternating with Course 77. *The Novel* (1916, 1918).—For Seniors, Juniors may elect. Readings, references, reports and class-room talks. The course is mainly informal. Among the results that may follow the study of the novel are: (a) a sense of critical method, springing from the consideration of historical development and of types; (b) a deepened humanism, consequent on the study of acts and motives of men and the influences that modify them; (c) increased appreciation of artistic method and form; and (d) acquaintance with a kind of literature that has grown into great importance through the popularizing of science, the downward extension of learning, and the democratizing of society.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor NEAL.

77. **3. PROSE FICTION.**—Alternating with Course 75. *The Short Story* (1915, 1917).—For Seniors, Juniors may elect. Readings, references, reports and class-room talks. The course is mainly informal. General texts, Neal's "Short Stories in the Making" and "To-day's Short Stories Analyzed." Particular results that may be obtained from short-story study are: (a) self-culture, the short story being well adapted to stimulate the literary, dramatic and imaginative faculties; and (b) acquaintance with that type in which American literature has especially succeeded.

1 class hour.

2 2-hour laboratory periods, credit 3.

Associate Professor NEAL.

79. **2. THE DRAMA AND SHAKSPERE.**—For Seniors, Juniors may elect. The source, technique and development of drama, accompanied by a study of Shakspeare, his mind, manner and technique. The minor Elizabethan dramatists, their influence on Shakspeare, and Shakspeare's influence on later writers, will be considered, as will the English social and industrial conditions of the time, their causes and their influence on Shakspeare and his fellow writers. Extensive reading, analysis and interpretation of his comedies, tragedies and histories, and of modern dramatists is included.

3 class hours.

Credit 3.

Assistant Professor SMITH.

80. **3. THE DRAMA AND SHAKSPERE.** For Seniors, Juniors may elect. As stated under Course 79.

2 class hours.

Credit 2.

Assistant Professor SMITH.

RURAL JOURNALISM.

(The courses in journalism emphasize rural journalism. They aim to acquaint the student with the elementary problems and theory of journalism as a profession or vocation, and to exercise him, as far as conditions permit, in the commoner aspects of journalistic work, such as news-gathering, news-writing, desk-editing and editorial writing. By rural journalism is meant the application of journalistic principles in getting and suitably presenting material adapted to the non-urban rather than to the urban or metropolitan reader, so far as their interests are distinct. This includes agricultural journalism, but is by no means confined to that. As practical work, members of the classes supply "The Bay State Ruralist," a feature page for the Springfield Sunday Union.)

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

Elective Courses.

50. 1. FOUNDATIONS OF WRITING; EXPOSITION.—For Juniors, Seniors may elect. Advanced composition; planning expository thought; expository structure; analysis of specimens, including contemporary articles from farm and rural life publications, bulletins, etc.; some bulletin writing, including presentation of technical information for nontechnical readers.

3 class hours.

Credit 3.

Associate Professor NEAL.

51. 2. FOUNDATIONS OF WRITING; NARRATION AND DESCRIPTION.—For Juniors, Seniors may elect. The fundamental elements of style, word-choice, diction, sentence form and paragraph types. Description of persons, places, objects, industries and productional processes, the temper and characteristic aspects of public gatherings, moods, behavior and character-sketching. Narration of incident, sustained action, events in series and the like, as in biography, dramatic situation, history and fiction.

3 class hours.

Credit 3.

Associate Professor NEAL.

52. 3. FOUNDATION OF WRITING, SPECIAL WRITING.—For Juniors, Seniors may elect. As stated under Courses 50 and 51.

3 class hours.

Credit 3.

Associate Professor NEAL.

Prerequisite, Journalism 51.

53. 1. NEWS-GATHERING AND NEWS-WRITING.—For Juniors, Seniors may elect. The foundation aims and conceptions of journalism. Readings, lectures, quizzes and personal conferences; reporting on runs and on assignment; regular reading of a daily paper and of a weekly review or farm journal, with reports thereon. The central purpose is to develop ability to pick out essentials from inessentials, perceive elements of interest, and present facts with appeal to the reader. (Further practice is provided in Courses 81 and 82.) Though given somewhat informally, the year's work will bring before the student such subjects as these: City and rural newspapers, class and trade journals, reviews, magazines. Journalistic style. Nature, classes and tests of news. News values. Form of the news story; lead and feature. Stories not primarily news; feature and human-interest stories, etc. News sources; runs, assignments, correspondents. News in the home community; farm reporting; employment of news to develop home interests. This course and Course 4 are recommended to students whose vocation will require the popular presentation of technical or other information; *e.g.*, extension workers, county agents, agricultural school instructors, experiment-station editors, survey and other social service workers, men engaged in sociological or economic investigations, landscape architects, and civil and sanitary engineers. Students desiring practice in the writing of special, magazine and feature articles might find this course adapted to their purpose.

6 laboratory hours, credit 3.

Associate Professor NEAL.

54. 2. NEWS-GATHERING AND NEWS-WRITING.—For Juniors, Seniors may elect. As outlined under Course 53, except that students who have

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

taken Course 53 will be assigned different readings and may be given a larger amount of reporting or other writing.

6 laboratory hours, credit 3.
Associate Professor NEAL.

55. **3. NEWS-GATHERING.**—For Juniors, Seniors may elect. As stated under Courses 53 and 54.

6 laboratory hours, credit 3.
Associate Professor NEAL.

77. **1. EDITORIAL MATERIALS AND METHODS.**—For Seniors, Juniors may elect. Readings, quizzes, reports and personal conferences; regular reading of one daily paper and one weekly review or rural life periodical; writing of editorial articles; current events or history. Though given somewhat informally, the year's work will bring before the student such subjects as these: Editing as interpretation and as executive direction; the urban, the agricultural and the rural editor; relation of the editor to his community; editorial organization. The business side of editing. The newspaper as a public utility; its relations to community welfare. Editorial subjects and writing; sources of information; rural topics and their interpretation. Recommended to non-majoring students who desire practice in discovering the significant aspects of matters of public attention and in effectively expressing thought thereon. Laboratory course.

6 laboratory hours, credit 3.
Associate Professor NEAL.

78. **2. EDITORIAL MATERIALS AND METHODS.**—For Seniors, Juniors may elect. As stated under Course 77.

6 laboratory hours, credit 3.
Associate Professor NEAL.

79. **3. EDITORIAL MATERIALS AND METHODS.**—For Seniors, Juniors may elect. As stated under Course 77.

6 laboratory hours, credit 3.
Associate Professor NEAL.

80. **1. ADVANCED JOURNALISTIC PRACTICE.**—Seniors. Preparation, editing and publication of a rural life page or periodical. Members of the class are expected to make several trips to "The Springfield Union" offices on days when "The Bay State Ruralist" page is making up, and individual students may sometimes be placed in charge of the make-up. Recommended (like Courses 53 and 54) to students interested in writing special, magazine and feature articles.

8 or 10 laboratory hours, credit 4 or 5.
Associate Professor NEAL.

81. **2. ADVANCED JOURNALISTIC PRACTICE.**—Seniors. As stated under Course 80.

8 or 10 laboratory hours, credit 4 or 5.
Associate Professor NEAL.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

82. 3. ADVANCED JOURNALISTIC PRACTICE.—Seniors. As stated under Course 80.

8 or 10 laboratory hours, credit 4 or 5.

Associate Professor NEAL.

PUBLIC SPEAKING.

Required Courses.

1. 1. 2 and 3. PUBLIC SPEAKING.—Freshmen. Freshman public speaking is required in the first, second or third term, at the option of the instructor. The course is concerned with the actual problems which confront the man who would speak convincingly and persuasively. Some attention is given to breath control and development of speaking voice, considerable attention to pronunciation and enunciation, and a large amount of attention to the preparation and delivery of extempore speeches. Text-book, Shurter's "Extempore Speaking," supplemented by lectures and discussions. 1st, 2nd or 3d terms as directed.

1 class hour.

Credit 1.

Assistant Professor PRINCE and MR. RAND.

Elective Courses.

50. 1. DEBATING.—For Juniors, Seniors may elect. Considerable time is given to the study of argumentation and brief-drawing. The class is divided into teams for the platform discussion of leading questions of the day. This course is designed to develop readiness in extempore speaking. It is recommended for those who desire to enter the intercollegiate debates.

3 class hours.

Credit 3.

Assistant Professor SMITH.

Prerequisite, Public Speaking 1.

51. 2. OCCASIONAL ORATORY.—For Juniors, Seniors may elect. Exercises for voice and gesture; a study of the elements of vocal expression and action; speeches on assigned topics; prescribed reading; the preparation and delivery of a formal oration or two. It is especially recommended for those who desire to enter the Flint contest.

3 class hours.

Credit 3.

Assistant Professor SMITH.

FRENCH AND SPANISH.

Associate Professor MACKIMMIE, MR. HARMOUNT.

FRENCH.

Required Courses.

1. 1. 2, 2. 3, 3. ELEMENTARY FRENCH.—Freshmen, open upon arrangement to other students. The essentials of grammar are rapidly taught and will be accompanied by as much reading as possible. This course is re-

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

quired of Freshmen presenting German for entrance who do not continue that language and have not studied French.

3 class hours each term.

Credit 3, each term.
MR. HARMOUNT.

4, 1. 5, 2. 6, 3. INTERMEDIATE FRENCH.—Freshmen, open upon arrangement to other students. Training for rapid reading. The reading of a number of short stories, novels and plays; composition, reports on collateral reading from periodicals and scientific texts in the Library.

3 class hours each term.

Credit 3, each term.

Associate Professor MACKIMMIE, MR. HARMOUNT.

Prerequisite: Required of Freshmen who present two years of French for entrance and do not take German.

Elective Courses.

25. 1. INTERMEDIATE FRENCH.—For Sophomores, open upon arrangement to other students. Training for rapid reading; the reading of a number of short stories, novels and plays; readings from periodicals and scientific texts in the Library.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisites, French 1, 2 and 3.

26. 2. INTERMEDIATE FRENCH.—For Sophomores, open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, French 25.

27. 3. INTERMEDIATE FRENCH.—For Sophomores, open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, French 25.

28. 1. ADVANCED FRENCH.—For Sophomores, open upon arrangement to other students. A reading course. Balzac's "Eugenie Grandet" and "Le Père Goriot" and other masterpieces of the nineteenth century; Brunetière's "Honore de Balzac" and Harper's "Masters of French Literature;" readings in the Library and written reports.

3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisites, French 4, 5 and 6.

29. 2. ADVANCED FRENCH.—For Sophomores, open upon arrangement to other students. As stated under Course 28.

3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisite, French 28.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

30. **3. ADVANCED FRENCH.**—For Sophomores, open upon arrangement to other students. General view of the history of French literature; Kastner and Atkins' "History of French Literature," Representative works of the important periods will be studied in class. Outside reading will be required.
3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisites, French 25 and 26, or French 28 and 29.

50. **1. SCIENTIFIC FRENCH.**—For Juniors, Seniors may elect. This course is planned to meet the requirements of the individual student and aims to equip him with exact English equivalents for the French scientific terms in his particular science. Word lists of scientific terms will be required and also weekly readings and reports from scientific works in the subject in which he is majoring. Several scientific readers will be read.
3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

51. **2. SCIENTIFIC FRENCH.**—For Juniors, Seniors may elect. As stated under Course 50.
3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisite, French 50.

52. **3. SCIENTIFIC FRENCH.**—For Juniors, Seniors may elect. As stated under Course 50.
3 class hours.

Credit 3.

MR. HARMOUNT.

Prerequisite, French 51.

75. **1. FRENCH LITERATURE.**—For Seniors, Juniors may elect. The object of Courses 75, 76, and 77 is to give an introduction to recent movements in French literature. 75 will deal with the drama, and plays by Augier, A. Dumas, fils, Delavigne, and some contemporary dramatists will be read and studied.
3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

76. **2. FRENCH LITERATURE.**—For Seniors, Juniors may elect. This course deals with the novel. Works by Flaubert, the de Goncourts, and Zola will be read. Written reports are required on outside reading.
3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, French 75.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

77. **3. FRENCH LITERATURE.**—For Seniors, Juniors may elect. Modern criticism. Sainte-Beuve, *Causeries de Lundi* (Harper) and works by Taine, and Renan. Reference book, Lanson's "*Histoire de la Litterature Franciase.*"
3 class hours. Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, French 76.

SPANISH.

Elective Courses.

50. **1. ELEMENTARY SPANISH.**—For Juniors, Seniors may elect. Open to other students upon arrangement. Grammar, with special drill in pronunciation; exercises in conversation and composition. Reading from a reader and selected short stories.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

51. **2. ELEMENTARY SPANISH.**—For Juniors, open to other students upon arrangement. As stated in Course 50.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, Spanish 50.

52. **3. ELEMENTARY SPANISH.**—For Juniors, open to other students upon arrangement. As stated in Course 50.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, Spanish 51.

75. **1. MODERN SPANISH AUTHORS.**—Seniors. Reading from modern Spanish novel and drama. Translation of English into Spanish. Private reading.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, Spanish 52.

76. **2. MODERN SPANISH AUTHORS.**—Seniors. As stated in Course 75.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, Spanish 75.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

77. 3. MODERN SPANISH AUTHORS. Seniors. As stated in Course 75.

3 class hours.

Credit 3.

Associate Professor MACKIMMIE.

Prerequisite, Spanish 76.

GERMAN AND MUSIC.

Associate Professor ASHLEY, MR. JULIAN.

GERMAN.

Required Courses.

1. 1. 2. 2. 3. 3. ELEMENTARY GERMAN.—Freshmen, open upon arrangement to other students. Grammar composition and reading. Especial attention is given to oral work in German and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German.

3 class hours, each term.

Credit 3, each term.

Associate Professor ASHLEY and MR. JULIAN.

4. 1. 5. 2. 6. 3. INTERMEDIATE GERMAN. Freshmen, open upon arrangement to other students. Selected works of Schiller, Heine and Goethe, Grammar review and advanced prose composition.

3 class hours, each term.

Credit 3, each term.

Associate Professor ASHLEY.

Prerequisite: Required of Freshmen who present two years of German for entrance and do not take French.

Elective Courses.

25. 1. INTERMEDIATE GERMAN.—For Sophomores, open upon arrangement to other students. Reading of such works as Sudermann's "Frau Sorge," "Wilhelm Tell," "Die Journalisten," etc. Grammar review.

3 class hours.

Credit 3.

MR. JULIAN.

Prerequisites, German 1, 2, and 3.

26. 2. INTERMEDIATE GERMAN.—For Sophomores, open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit 3.

MR. JULIAN.

Prerequisite, German 25.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

27. **3. INTERMEDIATE GERMAN.**—For Sophomores, open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit 3.

MR. JULIAN.

Prerequisite, German 26.

28. **1. ADVANCED GERMAN.**—For Sophomores, open upon arrangement to other students. Reading and studying of Goethe's most important literature productions.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisites, German 4, 5, and 6.

29. **2. ADVANCED GERMAN.**—For Sophomores, open upon arrangement to other students. As stated under Course 28.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 28.

30. **3. ADVANCED GERMAN.**—For Sophomores, open upon arrangement to other students. As stated under Course 28.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 29.

Elective Courses.

50. **1. SCIENTIFIC GERMAN.**—For Juniors, Seniors may elect. Reading in German of modern magazine articles and works of a scientific nature. Different work assigned according to needs of individual students.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisites, German, 4, 5 and 6, or German 25, 26 and 27.

51. **2. SCIENTIFIC GERMAN.**—For Juniors, Seniors may elect. As stated under Course 50.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 50.

52. **3. SCIENTIFIC GERMAN.**—For Juniors, Seniors may elect. As stated under Course 50.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 51.

75. **1. GERMAN LITERATURE.**—Seniors. Advanced language and literary study. Conducted entirely in German. Lectures on German literature

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

and history; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as "Nibelungenlied," Goethe's "Faust," and one modern typical drama.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisites, German 28, 29 and 30.

76. **2. GERMAN LITERATURE.**—Seniors. As stated under Course 75.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 75.

77. **3. GERMAN LITERATURE.**—Seniors. As stated under Course 75.

3 class hours.

Credit 3.

Associate Professor ASHLEY.

Prerequisite, German 76.

78. **1. CONVERSATION AND COMPOSITION.**—For Seniors, Juniors may elect. Translating connected English into German. Reproducing outside readings in German orally in class.

1 class hour.

Credit 1.

Associate Professor ASHLEY.

Prerequisites, German 4, 5 and 6, or German 25, 26 and 27.

79. **2. CONVERSATION AND COMPOSITION.**—For Seniors, Juniors may elect. As stated under Course 78.

1 class hour.

Credit 1.

Associate Professor ASHLEY.

Prerequisite, German 78.

80. **3. CONVERSATION AND COMPOSITION.**—For Seniors, Juniors may elect. As stated under Course 78.

1 class hour.

Credit 1.

Associate Professor ASHLEY.

Prerequisite, German 79.

MUSIC.

Elective Courses.

50. **1. HISTORY AND INTERPRETATION OF MUSIC.**—For Juniors, Seniors may elect. History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school—Bach, Händel, Haydn, Gluck and Mozart.

1 class hour.

Credit 1.

Associate Professor ASHLEY.

Heavy faced type indicates the term in which the course is given.
Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

51. **2. HISTORY AND INTERPRETATION OF MUSIC.**—For Juniors, Seniors may elect. A continuation of Course 50. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera. The Modern school and Modern composers.
1 class hour. Credit 1.

Associate Professor ASHLEY.

52. **3. HISTORY AND INTERPRETATION OF MUSIC.**—For Juniors, Seniors may elect. As stated under Courses 50 and 51.
1 class hour. Credit 1.

Associate Professor ASHLEY.

DIVISION OF RURAL SOCIAL SCIENCE.

President BUTTERFIELD.

AGRICULTURAL ECONOMICS.

Professor CANCE, MR. HOTIS, MR. STRAND.

Required Course.

26. **2. AGRICULTURAL INDUSTRY AND RESOURCES.**—Sophomores. A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers' demand. The principal agricultural resources of the United States will be studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions.
5¹/₂ class hours. Credit 5.

Professor CANCE, MR. HOTIS, MR. STRAND.

Elective Courses.

50. **1. ELEMENTS OF AGRICULTURAL ECONOMICS.**—For Juniors, Seniors may elect. This course is designed to follow the required work in the elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; determination of price; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics and field work.
5 class hours. Credit 5.

Professor CANCE.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

51. **1. HISTORICAL AND COMPARATIVE AGRICULTURE.**—For Juniors, Seniors may elect. Recommended to students in journalism or education. A general survey of agriculture, ancient and modern; feudal and early English husbandry; the later development of English agriculture; the course of agriculture in the United States, with special emphasis on the development of agriculture in New England. An attempt will be made to measure the influence of times, peoples and countries in producing different systems of agriculture, and to ascertain the causes now working to effect agricultural changes. Lectures, readings and library work.

5 class hours.

Credit 5.

MR. STRAND.

52. **2. CO-OPERATION IN AGRICULTURE.**—For Juniors, Seniors may elect. The course treats of the history, principles and business relations of agricultural co-operation. (1) A survey of the development, methods and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, with particular reference to credit and purchase and the marketing of perishable products. Lectures, text, assigned readings and practical exercises.

5 class hours.

Credit 5.

Professor CANCE.

75. **1. THE AGRICULTURAL MARKET.**—For Seniors and Graduate Students, Juniors may elect. A study of the forces and conditions which determine the prices of farm products, and the mechanism, methods and problems concerned with transporting, storing and distributing them. Supply and demand, course of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies and field work.

5 class hours.

Credit 5.

Professor CANCE.

76. **2. TRANSPORTATION OF AGRICULTURAL PRODUCTS.**—For Seniors and Graduate Students, Juniors may elect. This course will sketch the development of the transportation in the United States, covering highways, waterways, railways and electric ways with reference to the facilities for and cost of transporting farm products, opening up new agricultural areas or industries, and contributing to the wealth and welfare of the agricultural population. Lectures, text and field work.

5 class hours.

Credit 5.

Professor CANCE.

77. **3. PROBLEMS IN AGRICULTURAL ECONOMICS.**—For Seniors and Graduate Students, Juniors may elect. An advanced course for students desirous of studying more intensively some of the economic problems affecting

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

the farmer. Some of these are: land problems—land tenure, size of farms, causes affecting land values, private property in land, taxation of farm property; special problems—cost of producing farm products, farm labor in New England, immigration, agricultural credit. Opportunity will be given, if practicable, for field work, and students will be encouraged to pursue lines of individual interest. 5 class hours.

Credit 5.

Professor CANCE.

80. 1. SEMINAR.—For Seniors and Graduate Students. Research in agricultural economics and history; New England agriculture to 1860. Library work and reports. If desirable some other topic may be substituted. Hours to be arranged.

1 2-hour laboratory period, credit 1.

Professor CANCE.

81. 2. SEMINAR.—For Seniors and Graduate Students. As stated in Course 80.

1 2-hour laboratory period, credit 1.

Professor CANCE.

82. 3. SEMINAR.—For Seniors and Graduate Students. As stated in Course 80.

1 2-hour laboratory period, credit 1.

Professor CANCE.

AGRICULTURAL EDUCATION.

Professor HART.

Elective Courses.

50. 1. MEANING OF EDUCATION (PSYCHOLOGY).—For Juniors, Seniors may elect. For teachers and others desiring an introduction to mental science. A study of the development, structure and functions of the nervous system and the sense organs; the development and nature of mental activities; the nature of the learning processes.

5 class hours.

Credit 5.

Professor HART.

51. 2. RURAL SCHOOL PROBLEMS.—For Juniors, Seniors may elect. Primarily for teachers. A study of agricultural education; the theory and practice of teaching; rural school organization; methods of instruction; the place and function of agriculture in the course of study for both rural and city schools; planning and practical work in school and home gardens; planning of equipment and ornamentation of rural school grounds.

2 class hours.

3 2-hour laboratory periods, credit 5.

Professor HART.

52. 4. RURAL SCHOOL PROBLEMS.—For Juniors, Seniors may elect. As stated under Course 51.

120 laboratory hours, credit 5.

Professor HART.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

53. **3. HISTORY AND PHILOSOPHY OF EDUCATION.**—For Juniors, Seniors may elect. For teachers and others desiring an introduction to educational theories. A study of educational ideals and movements as exemplified by leading nations and races; the growth of educational institutions as influenced by science and industry; the history and meaning of industrial and agricultural education.

5 class hours.

Credit 5.

Professor HART.

75. **1. PROBLEMS IN RURAL EDUCATION.**—For Seniors, Juniors may elect. For teachers or others interested in special phases of education, such as child development, physical and mental; school organization; rural schools; secondary schools; school programs; grading and promotion of pupils; school grounds and school architecture and equipment; normal schools and the preparation of teachers; agricultural teaching and agricultural schools.

4 class hours.

Credit 4.

Professor HART.

76. **2. PROBLEMS IN RURAL EDUCATION.**—Seniors. As stated under Course 75.

4 class hours.

Credit 4.

Professor HART.

77. **2. EXTENSION AND COUNTY AGENT WORK.**—For Seniors, Juniors may elect. The course consists chiefly of library research work. Each student will be required to produce one or more complete lectures under guidance both as to method of preparation and subject-matter, and one or more demonstrations. These lectures will be presented to public audiences in the presence of a board of critics. Some instruction will be given in organization and administration of the Extension Service. The Extension Service will be responsible for the public presentation and criticism. The student's major adviser will be responsible for the accuracy of the subject-matter. The Department of Agricultural Education will be responsible for the preparation of the lectures.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor HART.

78. **3. EXTENSION AND COUNTY AGENT WORK.**—For Seniors, Juniors may elect. As stated under Course 77.

3 class hours.

2 2-hour laboratory periods, credit 5.

Professor HART.

RURAL SOCIOLOGY.

Professor PHELAN, President BUTTERFIELD, Professor HART, MR. LUND,
MR. BAIRD.

Required Course.

27. **3. ELEMENTS OF RURAL SOCIOLOGY.**—Sophomores. A broad survey of the field of rural sociology, including such topics as the origin of rural

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Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

sociology, its methods and problems; relation of sociological to the scientific and technical aspects of agricultural problems; the development of the rural community in New England and the west, religious, educational and social ideals of rural people; characteristics and influence of the rural environment, the movement of the rural population, the effects of immigration; rural institutions, the school, the church, local government, effects of modern conditions of life on rural institutions; rural organization; problems of progress, an analysis of the needs of rural life in its further development. Lectures, readings and essays on assigned topics.

3 class hours.

Credit 3.

Professor PHELAN.

Elective Courses.

50. 1. SOCIAL CONDITION OF RURAL PEOPLE.—For Juniors, Seniors may elect. (A). The rural status; composition of the rural population, nature, extent, and causes of diseases and accidents, health agencies of control; extent and causes of rural delinquency and dependency, conditions of temperance of sexual morality and family integrity; child labor, women's work and position; standard of living, size of family; cultural ideals; community consciousness and activity; standards of business conduct and of political ethics.

(B). Rural Social Psychology: Characteristics of the rural mind, character of hereditary and environmental influence; nature and effect of face to face groups; fashion, conventionality, custom, character of discussion, and of public opinion.

3 class hours.

Credit 3.

Professor PHELAN.

51. 2. RURAL GOVERNMENT.—For Juniors, Seniors may elect. A general survey of the development of rural government in the United States; origin of the New England town, its influence upon the west, advantages, development of efficiency, county government, the influence of the farmer in legislation, good roads movement, credit, facilities, taxation, boards of agriculture, agricultural colleges and experiment stations in relation to rural welfare; national government; a general survey of political organizations and movements among farmers in the United States and foreign countries and their influence in shaping legislation; relation of the Department of Agriculture, postal system, the various national commissions and agencies to rural welfare. Lectures, readings, written exercises on assigned topics.

3 class hours.

Credit 3.

Professor PHELAN.

52. 3. RURAL ORGANIZATION.—For Juniors, Seniors may elect. A study of the organized agencies by which rural communities carry on their various forms of associated life, particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment; principles underlying leadership, qualifications of the paid leader and the

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lay leader; the field of rural social service, national, State and local, preparation and opportunity for service; rural community building, a study of organized ways and means by which aid is given local communities.

3 class hours.

Credit 3.

President BUTTERFIELD.

75. **1 and 3. FARMERS' ORGANIZATIONS.**—For Seniors, Juniors may elect. The history, purposes and achievements of the Grange, the Farmers' Union, farmers' clubs, village improvement associations, boys' clubs, etc.; the method, scope and history of local, State and national associations formed about some farm product, their influence in forming class consciousness and in shaping agrarian legislation; need of federation. Lectures, readings and essays on assigned topics.

3 class hours.

Credit 3.

Professor PHELAN.

76. **1. FIELD WORK IN RURAL SOCIOLOGY.**—For Seniors, Juniors may elect. This course is designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work will be carried on in co-operation with the various college agencies engaged in rural service. Any project for which credit in this course is to be asked must first have the approval of the head of the department.

From 2 to 6 laboratory hours, credit 1 to 3.

Professor PHELAN.

Prerequisites, Rural Sociology 27 and 52.

77. **2. RURAL SOCIAL SURVEYS.**—For Seniors, Juniors may elect. A careful study of the theory and function of statistics, the limitations and difficulties in the use of statistics, the interpretation of statistical data, various methods of graphic representation; a study of surveys, kinds and use, method of gaining information, the basis for conclusions, value of information gained. Text and lectures.

3 class hours.

Credit 3.

Professor PHELAN.

78. **2. RURAL AND BUSINESS LAW.**—For Seniors, Juniors may elect. The work of this course will cover such points as land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper and distinctions between personal and real property. Text, written exercises, lectures and class discussions.

5 class hours.

Credit 5.

Professor HART.

79. **1 SEMINAR.**

Credit 1 to 3.

Professor PHELAN.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

80. 2 SEMINAR.

Credit 1 to 3.
Professor PHELAN.

81. 3 SEMINAR.

Credit 1 to 3.
Professor PHELAN.

GENERAL DEPARTMENTS.

MILITARY SCIENCE AND TACTICS.

First Lieutenant H. W. FLEET, 19th Infantry, U. S. A.; Assistant: Ordnance Sergeant J. J. LEE, U. S. A., retired; Adjutant Assistant: Quartermaster Sergeant ALEX. SMART, U. S. A., retired.

(The Department of Military Science and Tactics conducts its work in conjunction with the Department of Physical Education and Hygiene, in accordance with the following statement:—

All candidates for a degree in a four-year course must take for three years three full hours a week of physical training. This work must be under college supervision. At least two years of the work must be taken in the Department of Military Science and Tactics, in accordance with the requirements of the War Department; the rest is to be taken in the Department of Physical Education.

Under this arrangement, the practical courses (drill) in military science are given in the first and third terms; the corresponding courses in physical education in the second term.

Under act of Congress (July 2, 1862), military instruction under a regular army officer is required in this college of all able-bodied male students. Men are excused from the exercises of this department only upon presentation of a certificate given by the college physician; minor disabilities which might bar enlistment are not considered. Students excused from military duty may be required to take equivalent work. The object of the instruction is to disseminate military knowledge in order that in emergency trained men may be found to command volunteer troops; but a further object is to give physical exercise, to teach obedience without detracting from self-respect, and to develop the bearing and courtesy that are as becoming in a citizen as in a soldier. Absences and other offenses of military nature, and those of which the military instructor may take cognizance as affecting discipline, are dealt with by the commandant in accordance with the regulations of the department; but delinquencies in theoretical instruction not strictly military in their nature are dealt with in accordance with the rules of the faculty.

Cadets in the graduating class who have shown special aptitude for military service are reported to the Adjutant-General of the United States army and to the Adjutant-General of Massachusetts; in making appointments from civil life to the regular or volunteer army, preference is given to those who have been so reported. The names of the three most distinguished are published in the "Official Register of the United States Army." Assignments to the band are made by the military instructor. Practice in the band is credited in place of drill and theoretical instruction.

The required uniform is of olive drab cloth, costing about \$17. It is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor. Students upon entering college are required to deposit \$17 with the college treasurer to cover the cost of the uniform. The sale of old uniforms is prohibited, unless the consent of the military instructor be obtained.)

Required Courses.

1. 1. TACTICS.—Freshmen. Theoretical instruction in infantry drill regulations through the battalion and ceremonies. Lectures on military subjects and military history.

1 class hour.

Credit 1.
Lieutenant FLEET.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
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50 to 74 inclusive Juniors
75 to 99 " Seniors

3. **3. TACTICS.**—Freshmen. As stated under Course 1.
1 class hour. Credit 1.
Lieutenant FLEET.

4. **1. DRILL.**—Freshmen. Practical instruction in infantry drill regulations through the battalion. Ceremonies.
3 laboratory hours, credit 1.
Lieutenant FLEET.

6. **3. DRILL.**—Freshmen. As stated under Course 4. Company training in bayonet exercises and physical exercises with and without arms.
3 laboratory hours, credit 1.
Lieutenant FLEET.

25. **1. TACTICS.**—Sophomores. Theoretical instruction in map problems in security and information. Combat. Lectures on military subjects and military history.
1 class hour. Credit 1.
Lieutenant FLEET.

27. **3. TACTICS.**—Sophomores. As stated under Course 25.
1 class hour. Credit 1.
Lieutenant Fleet.

28. **1. DRILL.**—Sophomores. Practical instruction in field service regulations in the service of security and information. Corporals are appointed from this class.
3 laboratory hours, credit 1.
Lieutenant FLEET.

30. **3. DRILL.**—Sophomores. As stated under Course 28: intrenching, combat.
3 laboratory hours, credit 1.
Lieutenant FLEET.

50. **1. MILITARY SCIENCE.**—Juniors. Theoretical instruction in the small arms firing regulations, in fire discipline, fire control and fire direction.
1 class hour. Credit 1.
Lieutenant FLEET.

52. **3. MILITARY SCIENCE.**—Juniors. As stated in Course 50.
1 class hour. Credit 1.
Lieutenant FLEET.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores .

50 to 74 inclusive Juniors
75 to 99 " Seniors

53. 1. DRILL.—Juniors. Practical instruction in the small arms firing regulations in target practice, estimating distances and field firing. Lieutenants and sergeants are appointed from this class.

3 laboratory hours, credit 1.
Lieutenant FLEET.

55. 3. DRILL.—Juniors. As stated under Course 53.

3 laboratory hours, credit 1.
Lieutenant FLEET.

Elective Courses.

75. 1. MILITARY SCIENCE.—Seniors. Theoretical instruction in Infantry drill regulations, field service regulations, and small arms firing regulations for company, battalion and regiment.

1 class hour.

Credit 1.
Lieutenant FLEET.

77. 3. MILITARY SCIENCE.—Seniors. As stated under Course 75.

1 class hour.

Credit 1.
Lieutenant FLEET.

78. 1. DRILL.—Seniors. Conduct drills of lower classes. Field officers and captains are appointed from this class. These officers are paid. The positions in every case are obtained by competition. It is to be understood that cadets obtaining these positions will be reported to the Adjutant-General of the army as distinguished cadets.

3 laboratory hours, credit 1.
Lieutenant FLEET.

80. 3. DRILL.—Seniors. As stated under Course 78.

3 laboratory hours, credit 1.
Lieutenant FLEET.

PHYSICAL EDUCATION AND HYGIENE.

Associate Professor HICKS, MR. GORE, MR. FITZMAURICE.

PHYSICAL EDUCATION.

(The Department of Physical Education conducts its work in physical training in conjunction with the Department of Military Science and Tactics, as explained in the note preceding the description of the courses in military science. All classified undergraduate students are given a physical examination upon entering).

Required Courses.

1. 1. HYGIENE.—Freshmen. Lectures, reading, quizzes and a report on some assigned topic of personal hygiene or sanitation.

1 class hour.

Credit 1.
Associate Professor HICKS.

Heavy faced type indicates the term in which the course is given.

Numbering of Courses:

1 to 24 inclusive Freshmen
25 to 49 " Sophomores

50 to 74 inclusive Juniors
75 to 99 " Seniors

5. **2. ELEMENTARY GYMNASTICS.**—Freshmen. Exercises, games and athletics.

3 laboratory hours, credit 1.

MR. GORE and MR. FITZMAURICE.

26. **2. GRADED GYMNASTICS.**—Sophomores. Exercises, games and athletics.

3 laboratory hours, credit 1.

MR. GORE and MR. FITZMAURICE.

51. **2. GYMNASTICS.**—Juniors. Drills, games and athletics.

3 laboratory hours, credit 1.

MR. GORE and MR. FITZMAURICE.

Elective Course.

77. **3. TRAINING COURSE.**—Seniors. History of physical education; supervision of indoor and outdoor athletic contests and games; athletic administration.

1 class hour.

Credit 1.

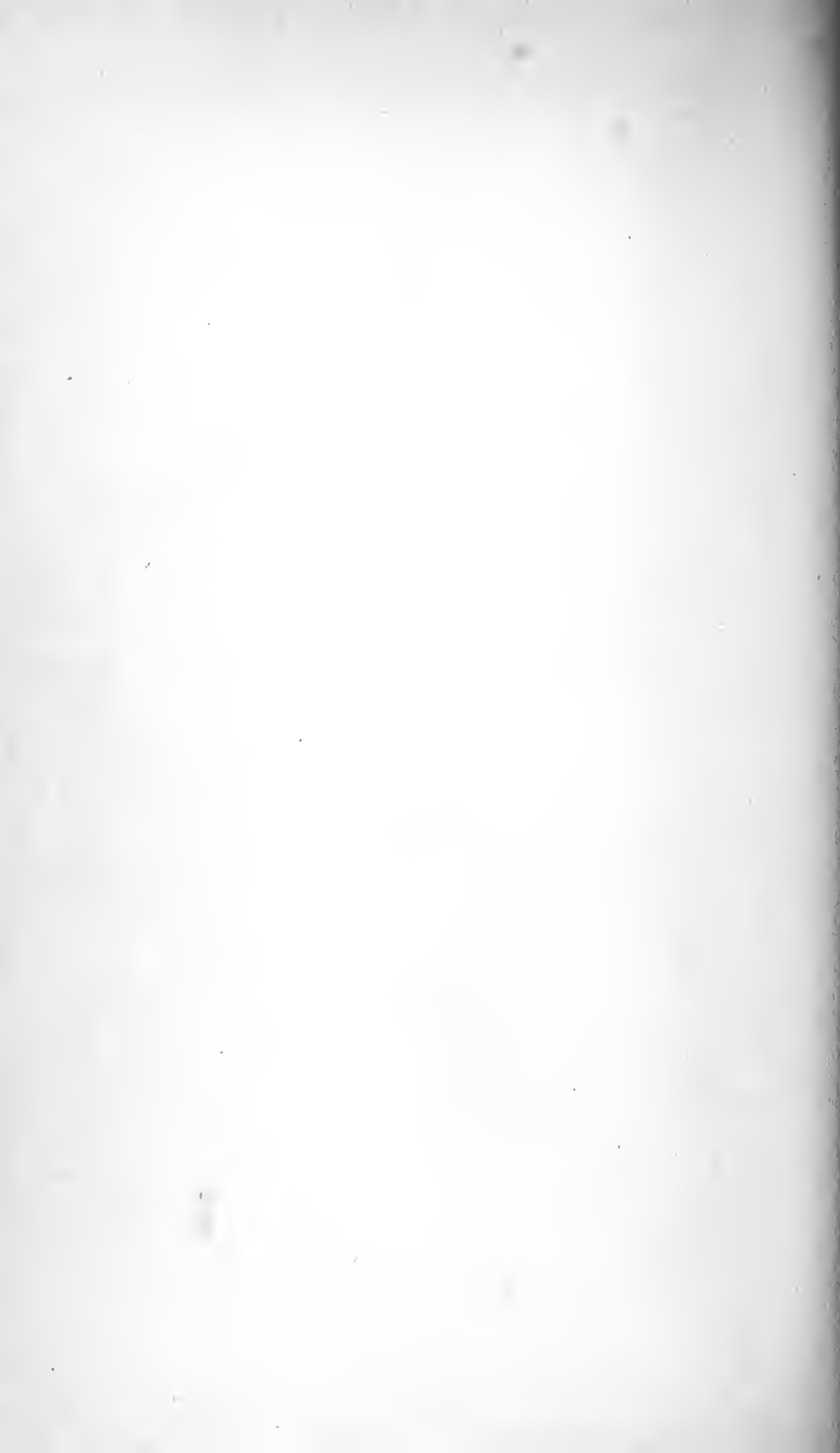
Associate Professor HICKS.

Heavy faced type indicates the term in which the course is given.

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FIFTY-THIRD ANNUAL REPORT

OF THE

MASSACHUSETTS

AGRICULTURAL COLLEGE.

PART I.

REPORT OF THE PRESIDENT AND OTHER OFFICERS
OF ADMINISTRATION

FOR FISCAL YEAR ENDED NOV. 30, 1915.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.
1916.



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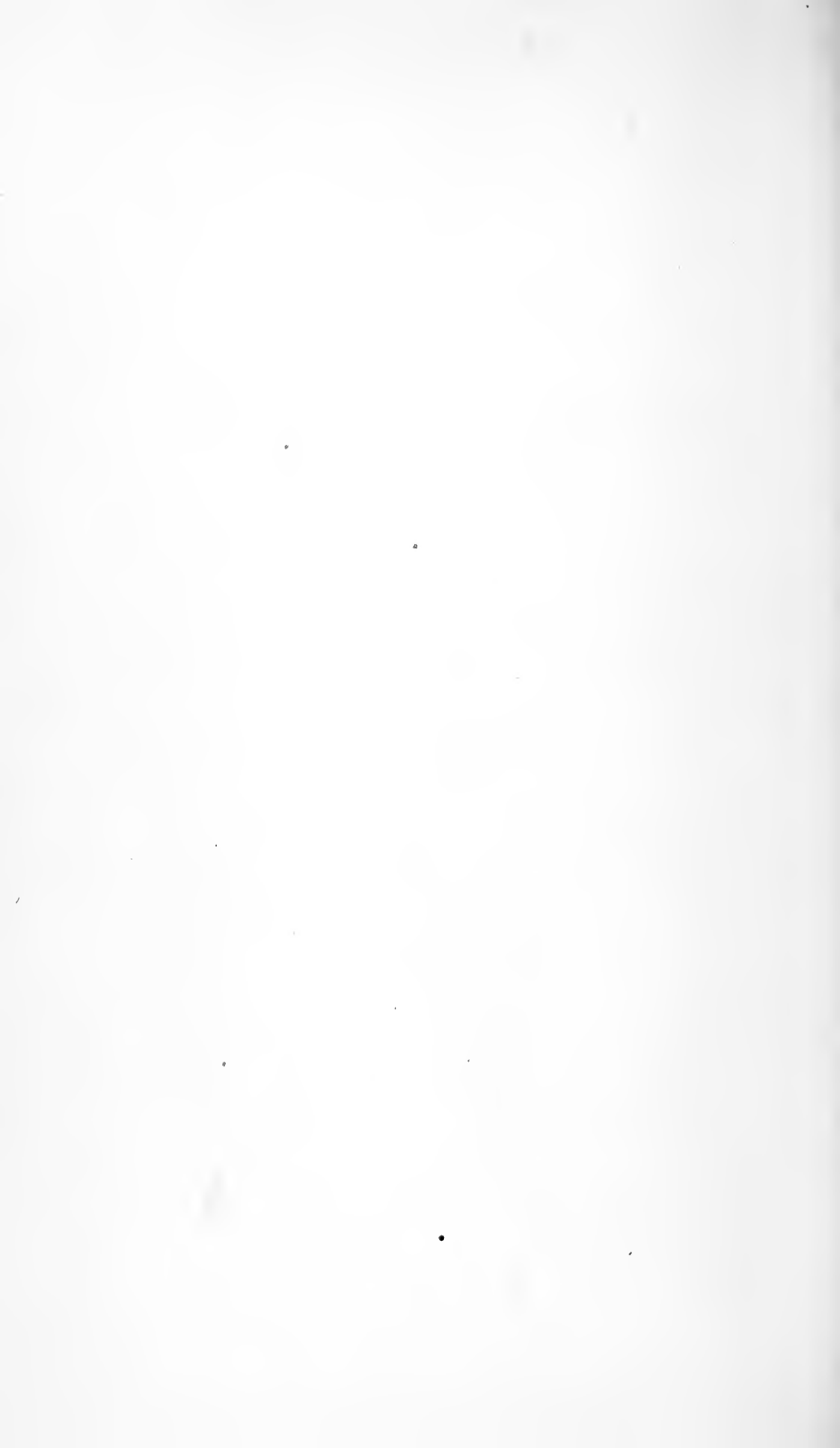


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APPROVED BY
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The Commonwealth of Massachusetts.

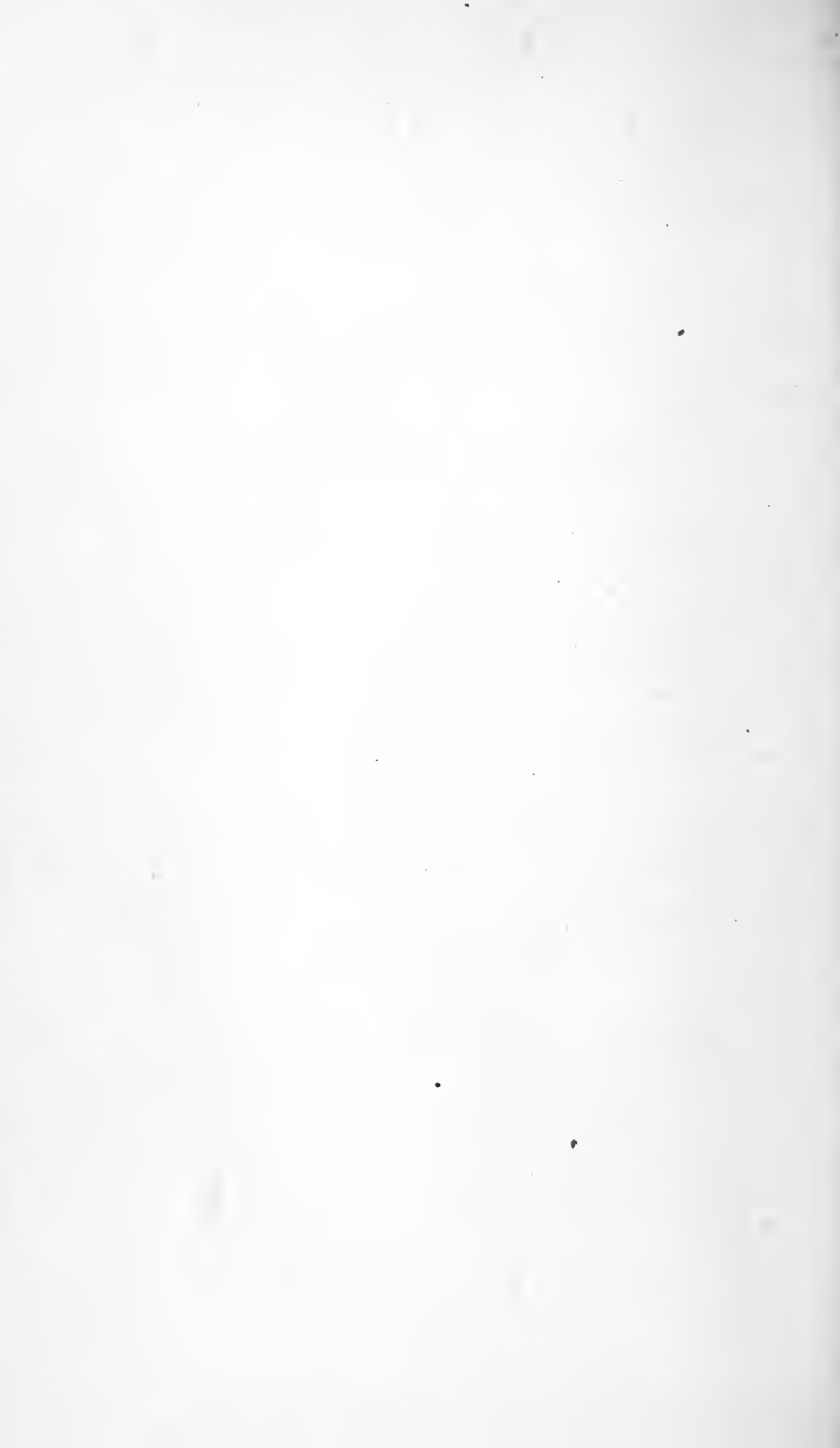
MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST, Dec. 1, 1915.

To His Excellency DAVID I. WALSH.

SIR: — On behalf of the trustees of the Massachusetts Agricultural College I have the honor to transmit herewith, to Your Excellency and the Honorable Council, Part I. of the fifty-third annual report of the trustees, for the fiscal year ended Nov. 30, 1915, this being the report of the president of the college and other officers of administration to the corporation.

I am, very respectfully, your obedient servant,

KENYON L. BUTTERFIELD,
President.



REPORT OF THE PRESIDENT OF THE COLLEGE.

Gentlemen of the Corporation.

I herewith submit my annual report as president of the Massachusetts Agricultural College, and with it transmit reports from the other administrative officers of the institution.

GENERAL REVIEW OF THE YEAR.

MARQUIS F. DICKINSON.

Mr. Marquis F. Dickinson died at his home at Marks Meadow, Amherst, Sept. 18, 1915. From 1905 to 1913 Mr. Dickinson was a member of our Board of Trustees; he served continuously on the important committees of buildings and grounds and of course of study and faculty; from 1907 to 1912 he was chairman of the former. The following tribute was adopted by the trustees, and spread upon their records, at a meeting held Oct. 30, 1915:—

Marquis Fayette Dickinson was a member of this Board from 1905 to 1913, succeeding to the vacancy caused by the resignation of Charles L. Flint. His appointment by Governor Bates was a surprise to many, and was criticized by a number of practical farmers, who thought at the time that a practical farmer instead of a lawyer should be appointed to the Board. The appointment proved a wise one, for we needed a man of Mr. Dickinson's training and temperament. We needed a lawyer to advise us in legal matters. Mr. Dickinson's services were invaluable in this respect.

But, aside from legal advice, Mr. Dickinson was a wise counsellor and a genial associate. His keen humor and happy suggestions often relieved a tense moment in our discussions. He possessed a charming personality, always sunny, buoyant and optimistic. He took a broad, hopeful view of life, and of the work of this institution. While Amherst College was his alma mater, yet he loved "Aggie" as much as he did Amherst, for it touched him to have been made one of its trustees.

He was a loyal friend of the college and of those who came to know him intimately. We regret that ill health compelled him to resign, but he left a delightful memory and a splendid example of faithful, cheerful, helpful service. This Board wishes to record its deep appreciation of that service, and to extend to his family its sincere sympathy.

CHANGES IN TRUSTEES.

About a year ago Mr. George P. O'Donnell of Northampton resigned from the Board of Trustees. Although a member less than two years he rendered able and helpful service. His successor, Mr. John F. Gannon, is assistant superintendent of schools in Worcester, and brings a knowledge and experience which have already proved of great value.

RESIGNATION OF PROF. J. ALLAN McLEAN.

The resignation of Prof. J. A. McLean was accepted to take effect September 30. Professor McLean was head of the Department of Animal Husbandry for four and one-half years, and during that time became an influential leader in stimulating interest in the live-stock industry of Massachusetts. Under his direction the animal husbandry work of the college was greatly improved. He developed a series of courses fully equipping young men to engage in the animal husbandry industry, or to become teachers, investigators or Extension Service workers in this field. He encouraged competitions in live-stock judging among the students, and the teams representing this college repeatedly won distinction in stock-judging contests in New England and at the International Dairy Show at Chicago. The live-stock equipment of the college was, under Professor McLean's direction, greatly amplified.

RETIREMENT OF CAPT. GEORGE C. MARTIN.

In January, 1915, Capt. George C. Martin, U. S. A., retired, was relieved of his duties as commandant and professor of military science and tactics at this institution. Captain Martin was first detailed to this post in September, 1905; in 1909, when his first detail expired, he was, at the request of the president, detailed for another period of four years; when his second term expired it was impossible to secure the detail of Lieut. Henry W. Fleet, the army officer whom we had selected for the work here. It was not until this last winter that the appointment of Lieutenant Fleet was made, and accordingly Captain Martin continued to serve as commandant until that

time. The trustees' committee on course of study and faculty, at a meeting held on Feb. 5, 1915, adopted the following resolutions with respect to Captain Martin's service: —

Whereas, For nearly ten consecutive years Capt. George C. Martin, U. S. A., retired, has rendered faithful and efficient service as head of the Department of Military Science at the Massachusetts Agricultural College; and

Whereas, During this period he has elevated the work of the department to a high plane of efficiency; and

Whereas, He has ever enjoyed the respect and admiration of students and faculty associates; be it

Resolved, That the trustees do hereby formally express their appreciation of and gratitude for the service thus rendered.

I wish to add a word of deep personal appreciation of Captain Martin's services to his department and loyalty to the full range of interests of the college.

PROF. RICHARD H. FERGUSON.

Richard Hay Ferguson, extension professor of Agricultural Economics since Jan. 1, 1914, died Dec. 1, 1915, after an illness of three months. He was a native of Belfast, Ire., but had spent most of his life in New Zealand, where he was graduated from Canterbury College at Christ Church. Coming to America in 1911 he completed the course at the Agricultural College, Guelph, Can., since which time he has been engaged in educational work. Having been in close touch with agricultural co-operation in New Zealand, he was well fitted to take up the extension work in co-operation and marketing. He was a tireless worker, and nearly twenty farmers' co-operative associations organized in Massachusetts since he came to the college testify to the success of his work. He made also a study of the methods and costs of milk distribution in Massachusetts, probably the most careful and complete that has been anywhere attempted. Mr. Ferguson was a man of wide interests, a thorough student, a loyal friend, a most valuable man. His service in making the beginnings of a business organization of Massachusetts farmers marks a new epoch in the agricultural history of the Commonwealth.

NEW PROFESSORIAL APPOINTMENTS.

On the retirement of Captain Martin the War Department detailed Lieut. Henry W. Fleet as commandant. Lieutenant Fleet was educated at the Culver Military Academy and at the University of Virginia. He has been a commissioned officer in the United States army since 1902, and just previous to his detail here served with his regiment in the southwest and in Mexico. It is evident that under Lieutenant Fleet the work in military science will be conducted on the same high plane of efficiency established by Captain Martin.

Orville A. Jamison was elected to the newly created position of assistant professor of dairying. Professor Jamison is a graduate of the Ohio State University, and has had three years of successful experience as a teacher at the Michigan Agricultural College and at the University of Maine.

Earl Jones succeeds Prof. E. M. McDonald, who resigned in February, 1915, from the position of assistant professor of agronomy. Professor Jones is a graduate of the Ohio State University, and received his degree of master of science from that institution in 1913. For two years he served as instructor in agronomy at the University of Maine.

John C. McNutt has been elected to succeed Prof. J. A. McLean as head of the Department of Animal Husbandry, and will assume his duties Jan. 1, 1916. Professor McNutt was born and reared on a farm in Ohio, and received his academic training at the Ohio State University. For two years he taught animal husbandry at the New Hampshire State College, and for the past four years has been professor of animal husbandry at the North Carolina College of Agriculture and Mechanic Arts. While in college Mr. McNutt specialized in animal husbandry, and on various occasions won distinction as a judge of live stock. While in New Hampshire he was particularly successful in training student stock-judging teams, and this has been followed by conspicuous success at North Carolina.

John Phelan was elected head of the Department of Rural Sociology to succeed Prof. E. K. Eyerly, whose resignation took effect Aug. 31, 1914. Professor Phelan was educated at the

Western State Normal School at Kalamazoo, Mich., and at the University of Michigan. He taught for several years in rural schools in the west. For two years he was director of the rural school department at the Western State Normal School, and for the past two years has held a similar position at the Stevens Point, Wis., normal school. Professor Phelan is well fitted by training and experience to develop our work in rural sociology in a satisfactory manner, and he has entered into the work with enthusiasm and skill.

Charles H. Thompson was chosen to fill the newly created position of assistant professor of horticulture. Professor Thompson was educated at the Kansas State Agricultural College, and for nearly twenty years was associated with the Missouri Botanic Gardens at St. Louis as teacher and research worker along horticultural lines. Professor Thompson will teach various courses in plant propagation and plant materials, thus relieving instructors whose primary work is along different lines.

Andrew S. Thomson takes the new position of assistant professor of market gardening. Professor Thomson is a graduate of Brown University, and has pursued graduate work at Columbia University. He has had a long and successful experience as a teacher and superintendent of schools. For three years he has been at the head of the department of agriculture at the Clarion, Pa., normal school.

Harold F. Thompson was secured to serve as head of the Department of Market Gardening. He will, however, devote most of his time to extension work among the market gardeners in the vicinity of Boston. Professor Thompson was graduated at this institution in 1905, and has had a very successful experience as a practical market gardener in the southeastern part of Massachusetts. From time to time he has also taught with marked success.

Sumner R. Parker, during the closing days of the year, was elected to a position in the Extension Service, which gives him the government title of assistant State leader. He will take the place of Mr. Benjamin W. Ellis, who has resigned to enter practical work. Mr. Parker's employment will begin Dec. 6, 1915. Mr. Parker is a graduate of this institution of the class of 1904, and was for many years manager of the Mixter Farm

at Hardwick, Mass. For nearly a year he has been agricultural adviser for the Franklin County Farm Bureau. His work will be that of organizing the farm bureau work in this State.

ATTENDANCE.

The total enrollment of students in work of college grade exceeds that of a year ago by 58, or $9\frac{1}{2}$ per cent. This increase is due almost entirely to the freshman class, which this fall has a registration of 211, as compared with 168 of a year ago. This is the largest entering class which we have ever had, exceeding that of 1913 by 9. The number is probably not so great, however, as it would have been had we had a normal increase in the size of the class entering in 1914. It should be noted that the present sophomore class has now an enrollment of 162, whereas its initial enrollment as freshmen was only 168. Usually a very much larger percentage of the class fail to meet our scholarship requirements for the first year. Attention should be called to the fact that 9 young women entered with the freshman class this fall; the total number of women students in regular attendance is now 18. (See Table V. for analysis of the enrollment.)

SHORT COURSES.

The usual winter and summer schools, together with their accompanying conferences, have been conducted this year with continued success. The enrollment in the winter school was 182, the same number as were present in 1914. On account of the prevalence in the State of the hoof and mouth disease it was deemed advisable to cancel the annual farmers' week, the school for tree wardens and the Polish farmers' day. The summer school of agriculture and country life had an enrollment of 162, this number being about 10 per cent. greater than in 1914. The school for rural social service, the school for library workers and the poultry convention were all well attended, as was also the conference on rural community planning. The demand for boys' agricultural camps has grown to such an extent that this year we were obliged to conduct three camps, the total enrollment being 92. This year, for the first time, we opened

a camp for country girls, the attendance being 13. (See Table V. for complete statistics of attendance at these schools and conferences.)

COMMENCEMENT.

The annual Commencement Day exercises were held Wednesday, June 16. For the first time in the history of the college the number of graduates reached and exceeded 100. The degree of bachelor of science was conferred on 100 men and 1 woman; the degree of master of science was conferred on 5 candidates; and the degree of doctor of philosophy on 5. The alumni dinner was attended by 241 alumni and officers of the college. Hon. Carl S. Vrooman, assistant secretary of the United States Department of Agriculture, delivered the Commencement address, his subject being "The Farmer of the Future."

CELEBRATION OF THE FIFTIETH ANNIVERSARY OF THE COLLEGE IN 1917.

Oct. 2, 1917, will mark the fiftieth anniversary of the opening of the college to students. It is planned to have at about this time an appropriate celebration of the event. A faculty committee is already at work on plans for celebrating this anniversary, and the details of the program will be announced at a later date. It is probable that a pageant, covering the history of New England agriculture, will be a prominent feature.

PANAMA-PACIFIC EXPOSITION.

The college prepared for the Panama-Pacific Exposition a display of horticultural appliances and methods; also an exhibit covering the work in rural social science. This exhibit was a part of the general agricultural exhibit prepared by the United States Department of Agriculture, which exhibit was awarded a gold medal.

THE FOUR-TERM PLAN AND SUMMER WORK.

During the past year the faculty has developed a project which has been approved by the trustees, whereby the college year will be divided into four terms or quarters, thus offering an opportunity to arrange work for college credit during the

summer months. This appears to be a distinctly progressive movement whereby the college plant, or such parts of it as can be utilized to advantage during the summer, will be used in the more adequate training of our students. It is expected, also, that by dividing the present college year into three terms instead of into two semesters better instruction can be given. It has been found that the task of readjusting our present curriculum to the new proposed plan is one of considerable magnitude. Accordingly, the new schedule will not be ready for operation until the fall of 1916.

NONATHLETIC STUDENT ACTIVITIES BOARD.

About a year ago several leaders of student activities requested that these nonathletic activities be organized in some such way as are the athletic activities. Accordingly, various conferences were held between representatives of the students and of the faculty, and as a result a Nonathletic Student Activity Board has been organized, following the plan adopted in the management of athletics. This board is composed of faculty, alumni and student representatives. Prof. H. E. Robbins has been appointed general manager of this work, and has general control and supervision over all of the student activities represented on the board; this supervision extends to all financial transactions as well as to schedules of appointments and other questions of administration and policy.

THE GRADUATE SUMMER SCHOOL, 1916.

For some years the Association of American Agricultural Colleges and Experiment Stations has held biennial sessions of a summer school intended to meet the requirements of persons on the agricultural staffs of the land grant colleges. The school is in session a month, the lectures being given by men prominent in their respective lines of work, both in this country and abroad. The school has convened heretofore at Ohio State University, Cornell University, the University of Illinois, Iowa State College, Michigan Agricultural College and the University of Missouri. The association, on our invitation, voted to hold the next session on our campus during the month of July,

1916; the acceptance was a compliment to the college, and the event should be of direct significance and of substantial aid in connection with our own graduate school.

COUNTY LEAGUES AND FARM BUREAUS.*

Under a law passed by the Massachusetts Legislature of 1913, some nine county leagues and farm bureaus have been organized and are at work. Their organization is part of a nation-wide movement which has introduced a new and aggressive agency into the system of agricultural education.

The plan of organization of these bureaus varies in different States. In the large majority of States the "county agent" is an employee of the agricultural college and directly responsible to the college. The farm bureau is always a voluntary organization, but usually receives local public aid as well as private financial assistance. In some cases the bureau is in reality a federation of existing organizations; in others it is entirely distinct. In our own State the county agent is an employee not of the college but of the farm bureau.

The precise relation between the college and the county farm bureaus is not yet fully defined either by the law or in practice, possibly not even in theory. It is important that in the near future this relationship should be developed to a complete and satisfactory understanding. Probably under the Massachusetts law the secret of correlation is a thoroughgoing co-operative scheme which recognizes the integrity of each bureau, provides for a certain amount of both State and Federal aid, and requires approval of "projects" and of employees by the State and Federal authorities. However this may be, it is clear that the work done by the farm bureaus and leagues should be part of the State system of popular agricultural education, and in particular should fit definitely with the Extension Service of the college.

THE MASSACHUSETTS AGRICULTURAL DEVELOPMENT COMMITTEE.

In my report for 1912 (page 46) I recommended "a commission on agricultural education and organization." On vote of the trustees, supplemented by a vote of the State Board of

Agriculture, a voluntary committee was organized, consisting of the representatives of some six agencies. One meeting of this committee was held and officers chosen, but no steps were taken towards the accomplishment of results. Last winter two or three proposals were made in the Legislature for commissions on agricultural development, but none of them passed the Legislature. As a direct result, however, of the discussion of these proposals there was organized a voluntary committee, which took the name of the Massachusetts Agricultural Development Committee, and which is at present composed of the agricultural agent of the State Board of Education, the State Forester, the chairman of the executive committee of the State Grange, a representative of the County Agricultural Schools, a representative of the State Federation of Improvement Leagues and Farm Bureaus, and the president of the Massachusetts Agricultural College.

In addition to your authorization of my own service with this committee, you also granted permission to Dr. Cance and Professor Morgan to serve as agents of the committee. The committee has considered the question of providing for an adequate study of the agricultural resources of the Commonwealth, a plan, which when developed further by the committee, I hope to be able to present to your Board. The committee has also served as a clearing house for the discussion of proposed agricultural legislation. I am confident that great service has already been rendered by this committee, and expect that before long the agricultural problem in Massachusetts will have been charted, the various agencies at work will have been listed, and that we will see the beginning of fuller co-operation of all rural agencies on behalf of the maximum improvement of Massachusetts agriculture and country life.

THE MASSACHUSETTS FEDERATION FOR RURAL PROGRESS.

At your annual meeting in January, 1913, you authorized the college administration to take steps to call a meeting for the organization of a federation of the agricultural and country life institutions of the State. This organization was effected in the autumn of 1913, under the name of the Massachusetts Federation for Rural Progress. It was discovered that there were

some twenty-five or thirty State-wide agencies, supported either at public or at private expense, interested in one phase or another of Massachusetts agriculture and country life. The federation has brought together representatives of these agencies a number of times, has held series of conferences on rural affairs, and in various other ways has made a real contribution to the ever present and significant task of organizing Massachusetts agriculture and country life.

LEGISLATIVE APPROPRIATIONS.

The Legislature of 1915 was requested to grant us appropriations for: (a) addition to the power plant, \$30,000; (b) miscellaneous additions, \$10,000; (c) student dormitory, \$40,000; (d) laboratory for microbiology, \$67,500. The only appropriations granted, however, were those for the laboratory for microbiology, \$67,500, and a portion of our request for the addition to the power plant, \$10,000. An attempt was made last winter to secure from the Legislature a continuing appropriation for buildings and other improvements; the request was for \$200,000 a year for six years. The Legislature, however, declined to grant this request.

ALUMNI ATHLETIC FIELD.

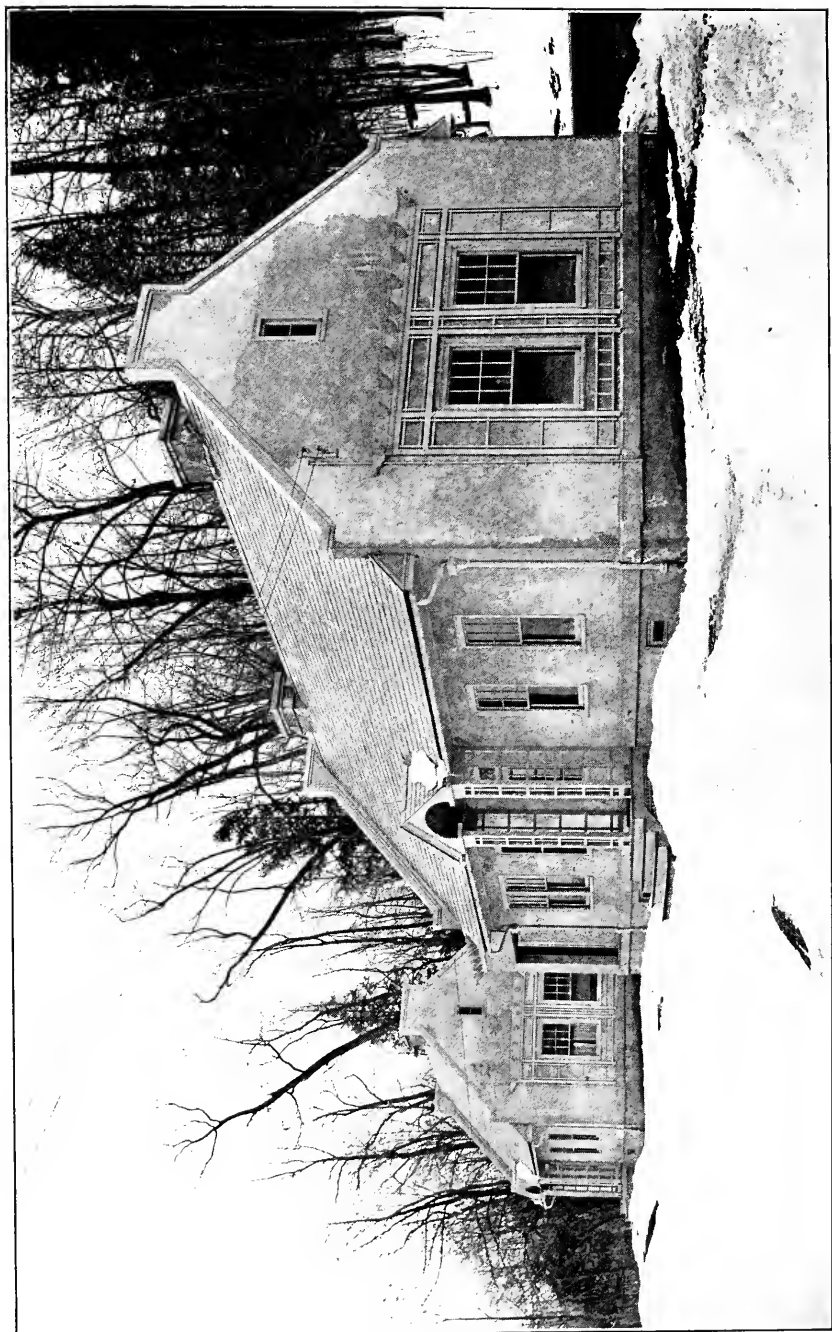
The past year has seen several important advances toward the completion of the athletic field. In June, 1915, sufficient funds had been raised to pay what was still due for grading the field, and a balance of about \$700 was on hand. Plans for fencing were considered, and it was decided to erect a permanent wire fence on the north, west and south sides, leaving the east side until certain parts of the grade could be extended. This fence was completed in September at a cost of \$1,900. The grounds service of the college has done considerable work in filling and in extension of grades, including the preparation of the baseball diamond; this work has cost \$500. With the opening of college in September it was evident that certain portions of the field were in condition for use in football. Therefore movable bleachers capable of seating 600 people were purchased at a cost of \$500.

The above statements show that approximately \$3,000 has been expended upon the field this year. Of this amount about \$1,500 still remains to be raised; it is hoped that this may be done before spring, so that other necessary construction may be started. The field was open for use this autumn, and its present condition is far better at this early date than was expected. It has a fine grass turf, and the surface is very firm and level. The drainage system seems to be working perfectly. The next step in the development of the field is the construction of a cinder track and tennis courts. With student assistance the running track should cost \$2,000 and the tennis courts from \$250 to \$300 each. When these additions have been made the athletic field will be quite adequately equipped for both inter-collegiate and intramural sports.

CONSTRUCTION, IMPROVEMENTS AND REPAIRS.

This year marked an epoch in the "brick and mortar" history of the institution on account of the amount of money expended on building construction. The infirmary buildings were started in the late fall of 1914 and were completed in May of this year. The agricultural building, Stockbridge Hall, which was begun in the summer of 1914, was completed by the middle of October of this year. This project also includes a small greenhouse for the Department of Agronomy, and one wing of the shops for the Rural Engineering Department. This building is described more fully on another page. The appropriation for these two groups of buildings aggregated \$225,000. The Legislature of 1915 granted an appropriation for improvements at the power plant, \$10,000, and for a laboratory for microbiology, \$67,500. The latter building was started in the early part of August and is well under way; the contract calls for the completion in March, 1916. With a legislative appropriation of \$10,000 for improvements at the power plant, in lieu of the \$30,000 in the original, the boiler room was enlarged and one new 200 horse-power boiler installed.

A number of minor improvements have been made, such as the resetting of two of the old boilers at the power plant, extending the cinder walk from the east experiment station to the



INFIRMARY BUILDINGS, COMPLETED IN 1915.

walk leading to the college ravine, constructing an incubator cellar for the Poultry Department and a small fumigating house for hospital work. Among the repairs might be noted the painting of the entomology building and the greenhouse range, and a number of small repairs at the sheep, young stock and quarantine barns.

THE INFIRMARY.

The Legislature of 1913 appropriated \$15,000 for the construction and the equipment of a student infirmary. Some delay was experienced in perfecting plans for this infirmary, and the building was accordingly not completed until the spring of 1915, and was opened for occupancy at the beginning of the present college year. It was found that the appropriation of \$15,000 was not adequate to construct a hospital of sufficient size to accommodate the students now in attendance at this institution. It was decided, therefore, to construct two cottages, which may be easily converted into isolation hospitals solely, should the general hospital be constructed later. In order to accommodate the resident nurse in the present equipment, apartments were added to one of the cottages. This plan precludes the introduction of a surgical operating room and other features in connection with a general hospital, such as laundry, emergency ward and other conveniences. The present scheme, therefore, is incomplete, inconvenient in many ways, and in some respects not wholly satisfactory. But on the other hand, it enables the institution to make a beginning in caring for its sick students, and meets in a fair way a very real need. It is hoped that funds may become available in the near future to complete the original plan for a general hospital building, and to add other isolation cottages.

A resident nurse now has charge of the hospital. A nominal charge is made to those students going to the infirmary for permanent treatment. The individual also is obliged to pay his own doctor's bills and for special nurses which may be required; also for special medicine supplies and laundry. No charge is made to students going to the infirmary for incidental treatment. The officials encourage students to go to the infirmary in case of illness or accidents, the purpose being to

improve the general health of the student body by treating illness in the incipient stage. A brief summary of the number of cases treated at the hospital since college opened in September is found in Table X.

STOCKBRIDGE HALL.

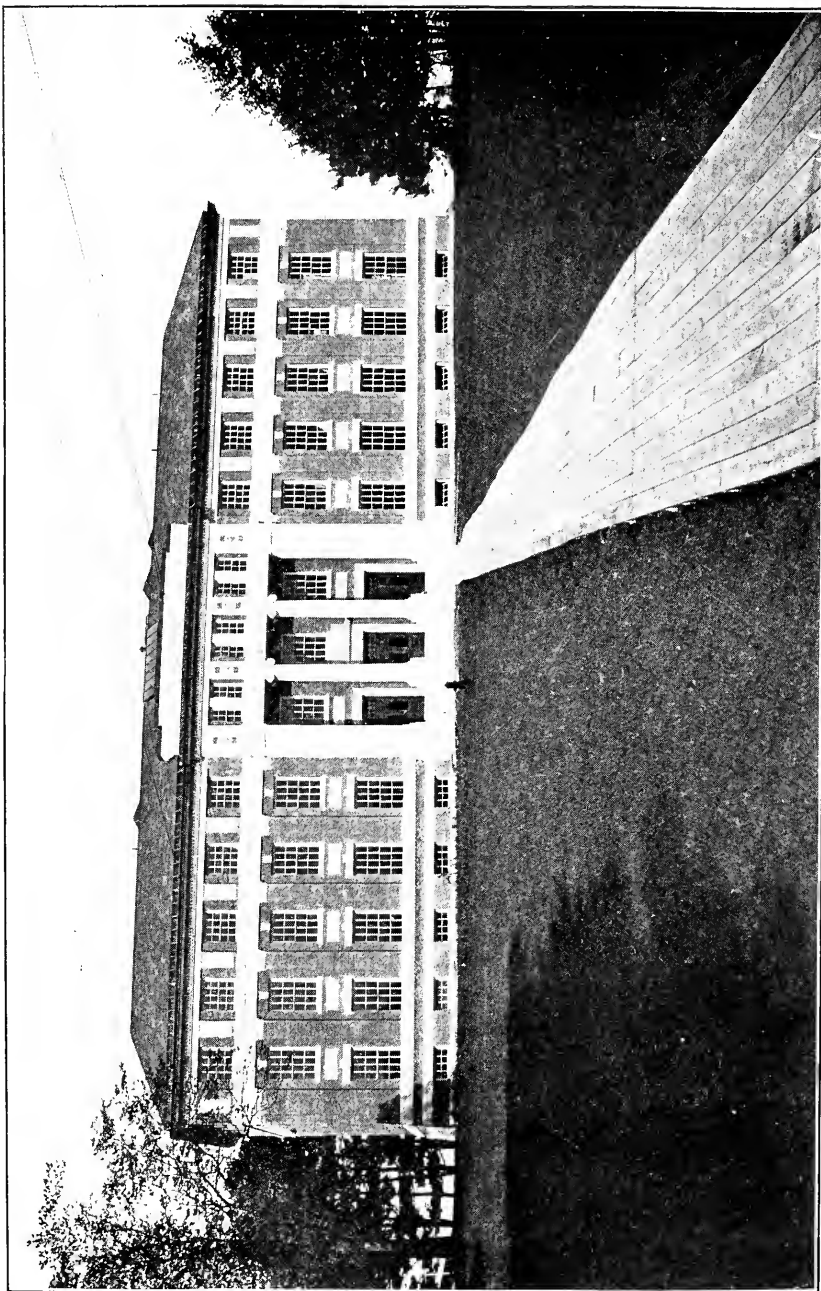
The new agricultural building, Stockbridge Hall, which was dedicated October 29, is well fitted for the purposes for which it was designed. The building is built of brick trimmed with limestone; the floors and interior supports are of reinforced concrete and steel, well protected. While this makes a permanent structure fireproof throughout, the fact that the interior walls on the three main floors are of gypsum block, allows the possibility of quite radical changes in the room arrangement without prohibitive expense, provided future needs make changes necessary. The interior finish is oak, and the lighting of the main building is semi-indirect. The building has a frontage of 166 feet and a depth of 60 feet. There are three floors and a basement available for college purposes. A private branch exchange telephone system has been installed, connecting the different offices in the building as well as the other offices in the Division of Agriculture.

The building will furnish laboratories, classrooms and offices for the Departments of Agronomy, Animal Husbandry, Farm Administration, Poultry Husbandry and Rural Engineering.

There are two large soil laboratories in the basement with stock rooms, balance rooms and a centrifuge room. A large laboratory for the use of the Department of Rural Engineering, as well as a lecture room and several storerooms, is also arranged for in the basement.

On the first floor there are five classrooms in addition to coat rooms and the offices of the Departments of Agronomy and Farm Administration.

On the second floor there are two large field crop laboratories, one at each end of the building, each laboratory having light on three sides. The second floor also contains the division library and reading room and the offices of the Departments of Animal Husbandry and Poultry Husbandry, as well as balance rooms and stock rooms.

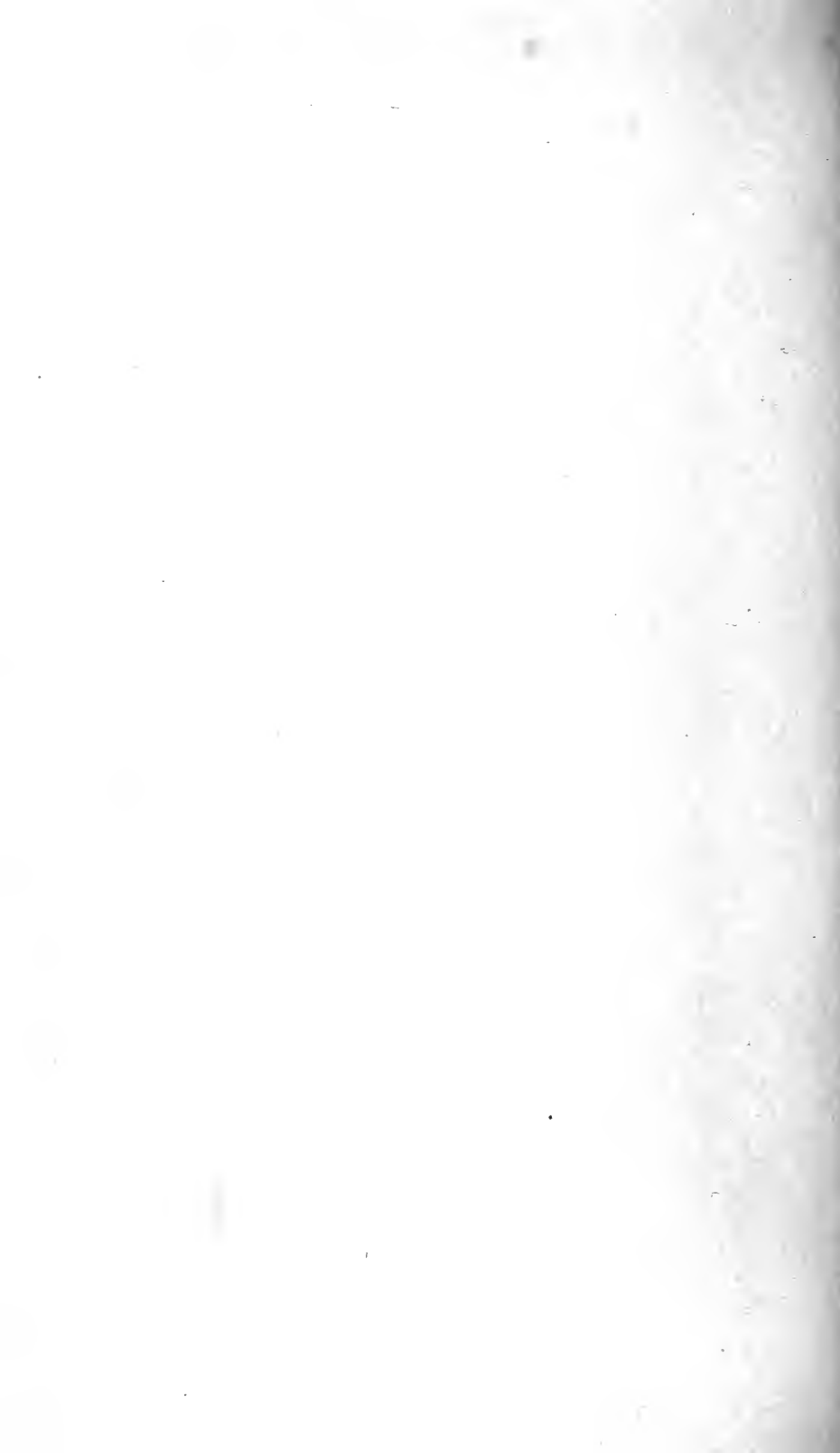


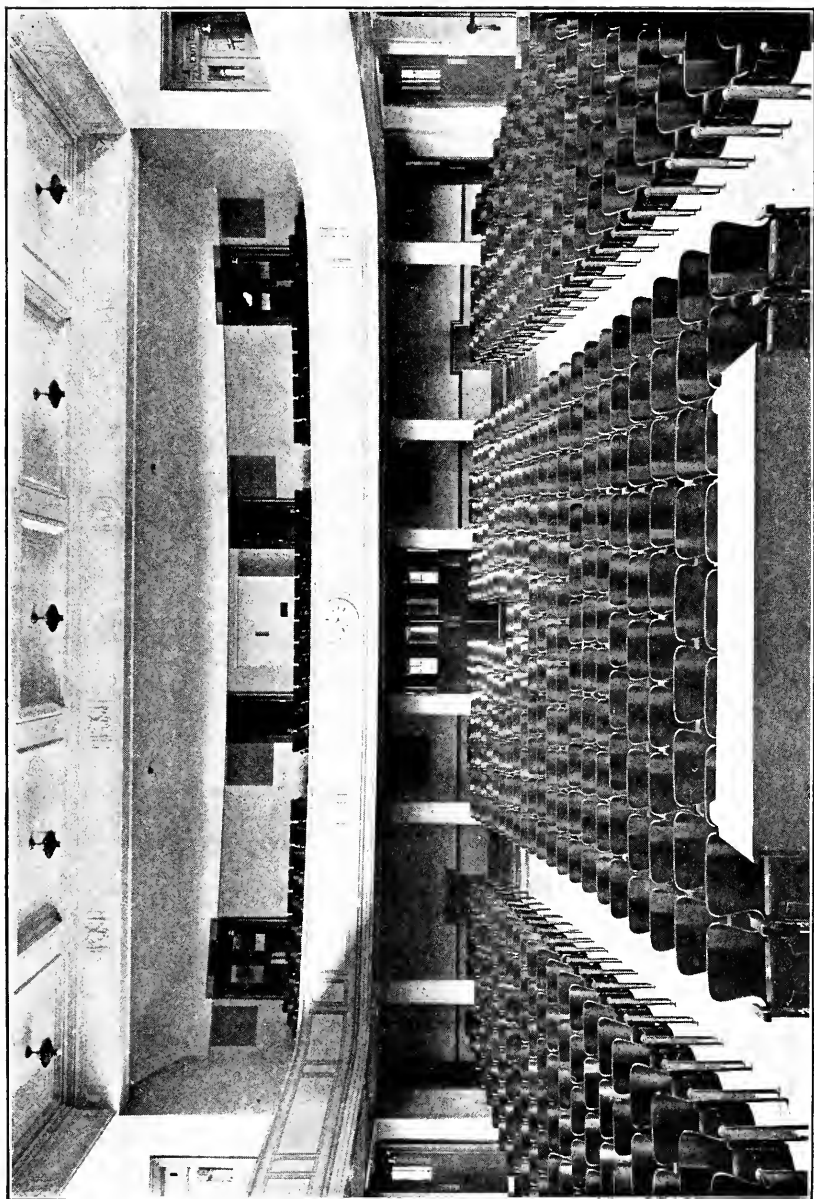
STOCKBRIDGE HALL, COMPLETED IN 1915.



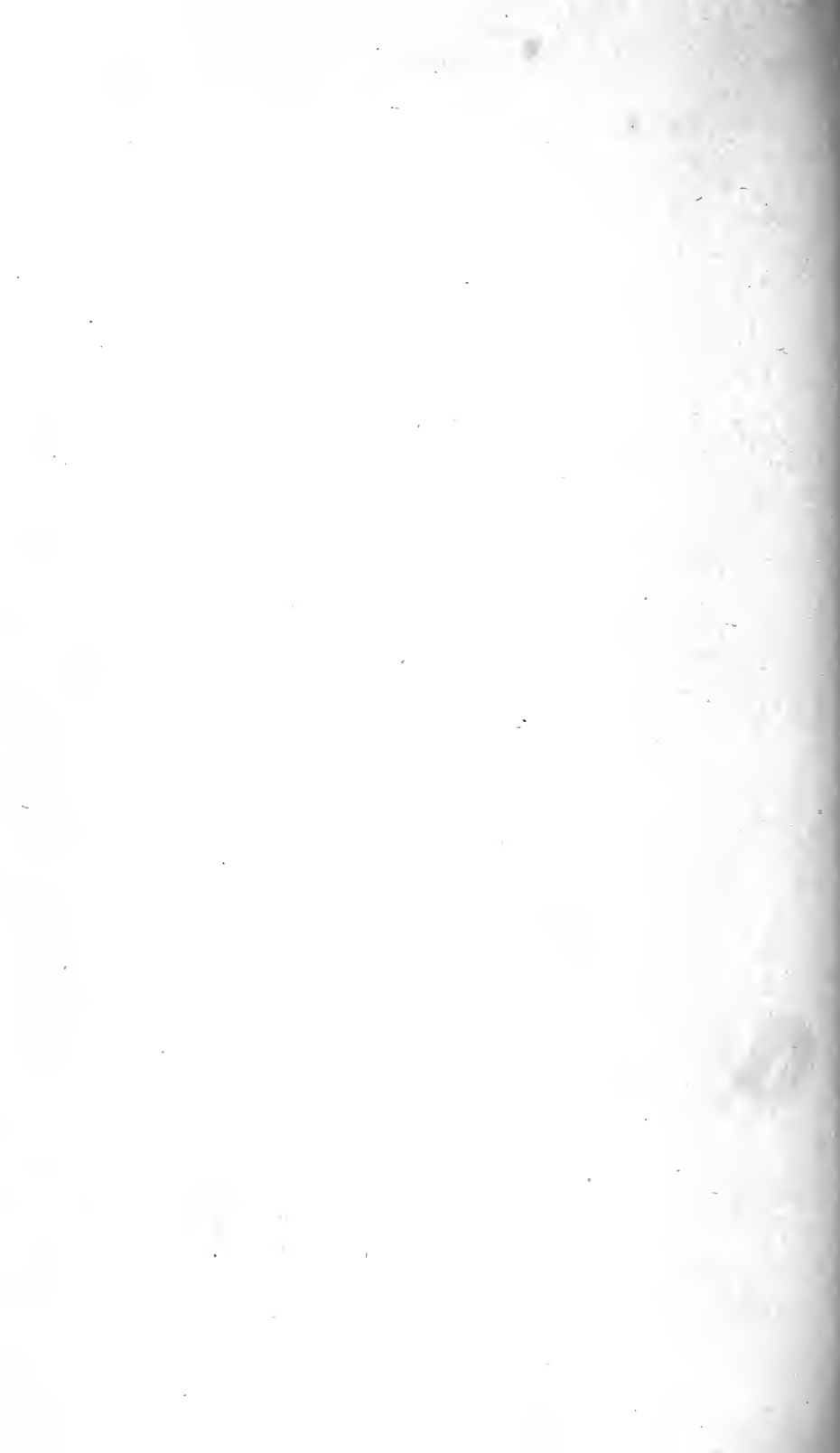


STOCKBRIDGE HALL, COMPLETED IN 1915.





AUDITORIUM, STOCKBRIDGE HALL.



On the third floor there are two large laboratories for student work in poultry husbandry, as well as suitable facilities for research work. There is also a large drafting room for the Department of Rural Engineering, a museum, and some office room that is being used temporarily by the Departments of Agricultural Education, English and Rural Journalism.

The attic contains rooms for the student janitors, and a large, well-lighted mouse-proof compartment for the storage of all kinds of grain and other plant material for class work.

An auditorium, 96 by 76 feet, is connected with the main building and seats 1,000 people. An ample stage is provided with curtain and footlights. A beautiful organ has been installed. A feature of the room is a motion-picture machine, the latter being included in the equipment, owing to its growing use in educational work.

Stockbridge Hall is our latest and best building. It represents the most modern ideas in regard to classrooms, offices and laboratories. No room is wasted. It is a substantial and beautiful building. It should be of service to the college literally for hundreds of years. It is probably the largest and most complete building of its kind in New England, and one of the best in this country.

Stockbridge Hall was formally dedicated Oct. 29, 1915. The following program was held in the afternoon, and in the evening the organ in the auditorium was dedicated by Prof. William C. Hammond of Holyoke, assisted by Miss Ada Chadwick of Mount Holyoke College. On October 2 the new auditorium was informally dedicated by the students and faculty, at which time the students gave a program of music and drama.

DEDICATION OF STOCKBRIDGE HALL, FRIDAY, OCT. 29, 1915.

Program.

"Tancred Overture," Rossini.

COLLEGE ORCHESTRA.

Prayer.

EDWARD M. LEWIS, Dean of the College.

"Levi Stockbridge and Charles L. Flint."

WILLIAM H. BOWKER, M. A. C., '71, Chairman of Trustees'
Committee on Buildings and Grounds.

"Agricultural Possibilities in New England."

JOSEPH L. HILLS, M. A. C., '81, Dean, College of Agriculture,
University of Vermont.

"Ballet Egyptien," A. Luigini.

I. Allegro non troppo.

III. Andante sostenuto.

II. Allegretto.

IV. Andante espressivo.

COLLEGE ORCHESTRA.

"The Engineer in Agriculture."

WILFRID WHEELER, Secretary of the State Board of Agriculture.

"The Stone which the Builders rejected."

Pres. KENYON L. BUTTERFIELD.

Beginning on page 9 of this report will be found the following tables and statistics: —

Table	I.	New Appointments.
Table	II.	Resignations.
Table	III.	Change in Title of Officers of the Institution.
Table	IV.	Speakers for the Year.
Table	V.	Attendance.
Table	VI.	Legislative Budget, 1915.
Table	VII.	Statistics of the Freshman Class.
Table	VIII.	Entrance Statistics of the Freshman Class.
Table	IX.	Official Visits by Outside Organizations.
Table	X.	Statistics of Patients at the Infirmary.

THE IMMEDIATE NEEDS OF THE COLLEGE.

THE LEGISLATIVE BUDGET FOR 1916.

Your Board has already voted the following budget for presentation to the incoming Legislature:—

Completion of power plant,	\$35,000 00
Library,	230,000 00
Completion of rural engineering shops,	12,000 00
Student dormitory,	40,000 00
Miscellaneous improvements and new equipment,	60,000 00
Extra labor on account of Saturday half holiday,	5,000 00
	<hr/>
	\$382,000 00

The following is a brief statement of the need for the appropriations as listed:—

Addition to the Power Plant, \$35,000.

Our request of a year ago was for an appropriation of \$30,000 to enlarge and further equip the power plant. The Legislature made a grant of \$10,000 for this purpose. With this money it was possible to extend the boiler room and to install one new 200 horse-power boiler. But new buildings mean new demands on both heat and light. The electrical load is a little over 400 kilowatts; the generators are rated at 150 kilowatts. It is imperative, therefore, that we increase our electrical equipment as soon as possible. To do this it will be necessary to build a building 40 by 60 feet, directly north of the boiler room, with full equipment. One new boiler should be added as a reserve. These improvements will cost \$35,000, the details being as follows:—

One 40 by 50 foot brick building,	\$10,000 00
One 300 kilowatt generator and turbine,	7,800 00
One switchboard,	2,000 00
Piping and labor for installing electrical equipment,	2,500 00
One 200 horse-power boiler,	4,000 00
Retaining wall and platform for coal pocket,	4,200 00
One chimney,	4,500 00
	<hr/>
	\$35,000 00

Library Building, \$230,000.

In 1902 the late President H. H. Goodell, in submitting his annual report to the trustees, said:—

Our library building is full to overflowing, and those books not in active circulation are being withdrawn and piled upon the floor or on the top of the cases. . . . It now numbers 23,681 volumes. . . . A new building properly equipped cannot be long delayed.

At the time that President Goodell wrote, the enrollment of regular students was 180; the enrollment of winter-course students 16; making a total maximum of 196 students who used the library.

Again, in 1903, President Goodell wrote:—

The library has entirely outgrown its building. Twenty-eight hundred volumes have been withdrawn from circulation. . . . Another building, fire-proof, with stackroom and all the adjuncts that add so much to the serviceableness of a modern library, is imperatively demanded.

At this time the enrollment of four-year men was 185; of winter-course students 28; making a total of 203 students who used the library.

At a time when there were less than 25,000 volumes in the library, and only 200 students, there was a strong feeling on the part of the administration that a new library building was needed. How much more is a new building needed when, after the lapse of thirteen years, we still have almost the same library facilities, but with nearly 50,000 volumes, or twice the number of books, and with 850 students, or over four times as many students.

The librarian, who has gone to the limit of his patience, suggests that the climbing of stepladders, the search for an unoccupied chair, and the squirming through crowded aisles necessarily detract greatly from serious study. It is hardly putting the case too strongly to say that we do not have respectable library accommodations. It must be remembered that the library is the vital intellectual center of college life. The library fosters every department of the college. It is a sort of

hub of a wheel which securely holds every spoke; or, to change the figure, every department has its roots firmly planted in the college library. The library is the big general laboratory of the institution. It is difficult to measure the loss from poor library facilities, for there are no standards; but it requires no argument to convince even the casual visitor to our library that we are seriously handicapped at every turn because of this deplorable lack of an adequate library building.

The present plans contemplate a modern fireproof building, with facilities that can be ultimately developed to care for 200,000 volumes and an institution of 2,000 students. It is also arranged so that the structure can be considerably enlarged when, in the course of time, demands upon the library cannot be met by the building which we desire to erect now.

Rural Engineering Shop, \$12,000.

The Rural Engineering Department is at present offering courses in farm structures, farm machinery and farm motors. The drafting room in Stockbridge Hall gives good accommodations for planning buildings and drawing plans, but we have no facilities for giving practical instruction in the erection of buildings. We have no means for giving even the rudimentary training in the handling of the saw, plane or hammer. Work on farm structures will lack the practical training in carpentry until we secure additional shop space and shop equipment. Laboratory work in farm machinery and farm motors is now given in three buildings, namely, Stockbridge Hall, Flint Laboratory and the rural engineering building. This has been found necessary from the fact that not one of the rooms available is large enough or suitable to accommodate all the equipment. The class work cannot be carried on most advantageously under these conditions. The situation will be improved only when we secure the addition called for in this project.

Student Dormitory, \$40,000.

For six years in succession your Board has asked the Legislature for an appropriation with which to build a dormitory. I took occasion in my report last year to present this matter as

definitely and cogently as possible. I can do no more now than to reiterate the arguments that have been made repeatedly. I still feel, as I judge your Board feels, that this is an important need. I am very sure that if the students were asked to vote on the greatest need of the institution at this time from the standpoint of physical plant, there would be a great majority in favor of a dormitory system. The matter is getting serious, and I hope the Legislature may see its way to an appropriation for this purpose.

Miscellaneous Improvements and Equipment, \$60,000.

This sum is needed to make it possible for us to undertake certain projects of improvements on the campus, such, for example, as the construction of suitable walks and roads and minor changes in buildings, in order to bring the present facilities up to the growing demands made upon them. New equipment is needed to meet the increased demands made upon the institution by the larger attendance. Old equipment also is to be replaced. A list of some 50 separate projects for improvement, and of 75 projects for equipment have been approved by your committee on buildings and grounds. It must be remembered that for two successive years the Legislature has made inadequate provision for these developments; needs, therefore, have been accumulating.

Extra Labor on Account of Saturday Half Holiday, \$5,000.

Chapter 288 of the General Acts of 1915 provided that the provisions of chapter 688 of the Acts of 1914 and amendments thereof, relative to making Saturday afternoon a half holiday for laborers, workmen and mechanics, shall apply to the Massachusetts Agricultural College. This act took effect May 27, 1915. The cost of labor for the year 1914 was approximately \$50,000. Since that time two new groups of buildings have been added to our campus. It is safe to estimate that the additional cost of labor will be in the neighborhood of \$5,000. It will be understood that this is an extra draft upon the current resources of the institution not anticipated when the five-year appropriation was adopted two years ago.

A Five-year Appropriation for Improvements.

Two years ago the Legislature passed a law granting the college a progressively increasing appropriation for maintenance for a period of five years. At that time it was expected that a similar grant would be made for improvements, including new buildings, miscellaneous improvements and purchase of land; but that was not done. Last year the trustees asked for a six-year appropriation for this purpose. The committee on agriculture cordially approved the plan, changing it to five years. The report, however, was not agreed to by the House committee on ways and means. This year your Board has voted to ask the Legislature for a five-year appropriation of \$200,000 annually, to cover new buildings, improvements, new equipment, and also for the purchase of land.

SUNDRY PROJECTS FOR LEGISLATIVE ACTION.

Seed Law.

The director of the experiment station, by authority of the trustees, has drafted a proposed seed law which will authorize the director of the experiment station to collect samples of seed, test them for purity and germination, and publish the results of the examination. In principle the measure is similar to that authorizing the analysis of feedstuffs, and the State will bear the expense of the work.

The agricultural awakening in Massachusetts has given rise to demands for aid from the college quite beyond the ability of the institution to supply with present resources. As a result, a number of interests are desirous of presenting to the Legislature projects for appropriations to increase at once the service of the college. In each case it has been made clear to the proposers of these projects that the college will be glad to do the work if the funds are made available, but that the existing obligations upon the institution cause the trustees to feel that they are not warranted in putting these projects into the college budget. In order that there may be a record of the attitude of the trustees, I am appending a brief statement of the trustees' action in each case.

Substation for Market-gardening Research.

The market gardeners in the vicinity of Boston have requested the assistance of the college in securing the passage of a bill appropriating funds for the establishment and maintenance of a substation for market-gardening research. The trustees have approved the plan, and have endorsed the bill, which will be introduced into the forthcoming Legislature, seeking an appropriation to be expended under the direction of the trustees of the Massachusetts Agricultural College for the purchase of real estate, and for experimental and other work on problems connected with market gardening.

Work in Poultry Husbandry.

The Massachusetts Poultry Association has asked the endorsement by the college of a bill that it proposes to introduce into the forthcoming Legislature, seeking an appropriation for further work in poultry husbandry. The trustees have approved the general idea embodied in the proposed bill, but suggested to those initiating the project that the bill be so modified as to make the trustees of the college administrators of the funds appropriated.

Boys' and Girls' Clubs.

There has been presented to the trustees for approval a proposed bill, seeking further State appropriations to be used in the more adequate supervision of boys' and girls' agricultural clubs. The trustees have approved the plan, though not assuming responsibility for introducing the bill. It is also the sense of the trustees that if the bill is passed, the money appropriated by the State for local support should go directly to towns.

The Tobacco Industry.

The tobacco growers of the Connecticut valley are about to introduce a bill into the Legislature providing for a small appropriation to carry on some special work of an experimental character in connection with their industry.

A STATE SYSTEM OF AGRICULTURAL EDUCATION.

In my report to your Board for the year 1911 I referred briefly to the need of soon considering the place of the college in a State system of agricultural education. During the past four years much progress has been made in the Commonwealth toward providing more adequate facilities for school training, as well as for dissemination work, in agriculture. New agencies have arisen. There is an increasing need of unification. The college has a profound interest in the new movements and its relationship to them. I think, therefore, that we should discuss with some care the problem thus suggested — a State system of agricultural education.

A Bit of History.

The present situation, although of recent origin, has its roots in an ancient and honorable chapter of educational history, and a brief review of this history is justified at this time. Massachusetts was one of the pioneers in the development of agricultural education.

The Massachusetts Society for the Promotion of Agriculture. — In 1792 the Legislature incorporated a society which still exists. At that date few societies of agriculture had been organized in any country, there being but two in Great Britain, and in this country only two others. The Massachusetts society was the first in America to receive legislative encouragement. The names of those who organized are the names of the most famous men of the time, — Samuel Adams, Gen. Benjamin Lincoln and others of equal prominence. The work of the society met with indifference and even ridicule on the part of many, and for the first twenty-five years of its existence it accomplished little. However, its leaders believed in its cause and they refused to give up the organization. They talked of an experimental farm, and the botanical garden at Cambridge is the result. Prizes were offered for essays on agricultural subjects, as well as premiums for actual work achieved along agricultural lines. In 1801 the society inaugurated a series of agricultural fairs at Brighton, which became famous in New England, and con-

tinued until 1830. The interest which this society aroused in agricultural matters led, in 1851, to the organization of the State Board of Agriculture.

Early Agricultural Schools. — An interest in providing schools for teaching agriculture showed itself in Massachusetts as early as 1820, when Andrew Nichols, addressing the Essex County Agricultural Society, spoke of the agitation for agricultural schools which Gov. DeWitt Clinton had inaugurated in New York. Nothing was done, however, and we find that four years later the Massachusetts Society for the Promotion of Agriculture was asked by the trustees of Dummer Academy, of Byfield, to help in the conduct of an experimental farm on lands belonging to that institution. This request the society refused because they felt that such an enterprise should be under the supervision of the State. What seems to have been the first actual effort to give agricultural instruction in the State was made at the Teachers' Seminary on Andover Hill, in 1840, when a course in scientific and practical agriculture was announced. Shortly after this, however, the institution was merged with Phillips Academy, and the agricultural feature disappeared. Just previous to 1860 Powers Institute, at Bernardston, conducted a course in agriculture and asked in vain for aid from the General Court.

The State Board of Agriculture. — Owing to the investigations made by Henry Colman into the conditions of agriculture in Massachusetts there was organized in 1851 the Central Board of Agriculture, which was intended to unite the existing local agricultural societies under one head. At a meeting of this Board in the following year they asked the Legislature to authorize the organization of a department of agriculture as one of the State offices. This act was passed, and that patron of agriculture, Charles L. Flint, became the first secretary, an office which he held for more than a quarter of a century. This Board "became the organ of the farming community," and has had a long and useful career.

The Massachusetts Agricultural College. — The first legislative effort to secure an agricultural college for Massachusetts was made in 1850, when a bill was presented to the General Court providing for the establishment of such a college and for an

experimental farm. This bill passed the Senate, but was rejected by the House. At the next session of the Legislature a committee reported upon the advisability of establishing agricultural schools and colleges, but no action was taken, and the matter did not again come up until 1856. In that year several interested gentlemen secured the incorporation of the Massachusetts School of Agriculture, Marshall P. Wilder heading the list. In 1860 the charter granted to this body was transferred to a group of citizens of Springfield, who endeavored to raise \$75,000 for the purpose, and would have succeeded, without doubt, if the outbreak of the civil war had not interfered with their plans. The passage of the Morrill act in 1862 made possible the establishment of the State college so long desired. In 1863 the State complied with the requirements of the grant and voted the establishment of the board of trustees for the new college, which opened its doors to students in October, 1867.

Agricultural Schools. — Agriculture as a branch of instruction in the secondary schools of the State has taken a prominent place during the last few years. The work is under the supervision of the State Board of Education. There are at present thirteen high schools of the State which give more or less extensive courses in agricultural subjects. Bristol and Essex counties have organized county agricultural schools, and Norfolk County will soon establish one. The instructors in agriculture serve their counties as agricultural advisers, some of them spending half of their time in the schoolroom and half in visiting and advising farmers. The Smith Agricultural School, in Northampton, is an endowed agricultural school, but receives public financial support.

Boys' and Girls' Agricultural Club Work. — The work among the boys and girls was begun by the Massachusetts Agricultural College in 1908, the first clubs being formed in Hampshire County, when some 500 responded to an invitation to join a potato-growing contest. So popular was the work that it was undertaken again in 1909, when the membership of the club increased to more than 1,000, although the work was still confined to Hampshire County. In the following year the invitation was extended to all boys and girls of the State, and the

growing of corn was added to that of potatoes. Since that time other lines of work have been undertaken — pig clubs, poultry clubs, canning clubs, and home economics, which teach cooking, sewing and various forms of housework. The membership of the clubs to-day has reached virtually 70,000, and of the 354 cities and towns of the State, 314 have instituted some form of club work for boys and girls.

The Extension Service. — In September, 1909, extension work in connection with the Agricultural College was begun by the present director, who worked alone for some time, with an appropriation of \$7,500. The staff and appropriations for the work have grown continually from that time, until to-day there are 16 members of the Extension Service faculty giving all their time to the work, and the State appropriation for extension work amounts to \$50,000.

County Leagues and Bureaus. — In the winter of 1913 a group of interested business men and farmers throughout the county organized the Hampden County Improvement League. The purpose of the organization is the improvement of agriculture and country life, and it has met with great success. There are at present employed as agents of the league an agricultural adviser, a horticultural adviser, a home-making adviser and a supervisor of boys' club work. The league publishes a weekly paper which gives timely advice on agricultural matters and keeps the public informed as to the work of the league generally.

There are farm bureaus in seven other counties of the State, doing practically the same work as is accomplished by the Hampden County Improvement League.

The Situation.

It will be observed from this review that there are already in existence parts of a system of agricultural education, but we have no system. We have many important pieces of new work, but they are not adequately co-ordinated, while some parts of the field are as yet untouched. It would appear to be a piece of real statesmanship to begin the task of planning a comprehensive system of agricultural education supported at public expense; for clearly such support is one of the great obliga-

tions of the Commonwealth. It will not be possible or desirable to provide immediately for every part of a complete system, but the needs of the State may be studied and adequate plans formulated so that new projects will fit into the system ultimately desired.

It is obvious that the Massachusetts Agricultural College should be an organic part of such a system of agricultural education. It cannot and should not try to administer the system; it should be in very intimate association with the controlling factors. The college should have definite responsibility in the organization of the materials and in the formulation of the methods used in all grades of agricultural instruction, in the preparation of teachers, and in assisting to correlate the parts of the system. We cannot disguise our interest in the problem. Not only should we have a part in the plan; we ought to make some real contribution to it, and to its continuing success.

I may say in passing that I have discussed this matter with the Commissioner of Education, and while Dr. Snedden cannot in any way be made responsible for the opinions that are here expressed, I think I violate no confidence in saying that broadly speaking our views coincide.

In discussing the requirements of an adequate State system of agricultural education we may outline the problem in the following aspects:—

- I. Some characteristics of a State system of agricultural education.
- II. The types of work to be recognized.
- III. The groups of persons to be reached.
- IV. The scope of agricultural education.
- V. The machinery to be invoked.
- VI. Administration.
- VII. A word of recommendation.

I. Some Characteristics of a State System of Agricultural Education.

1. *It should have Definiteness of Aim.* — Fundamentally, it is the province of agricultural education to help solve the rural problem. The rural problem is partly a question of securing better farm practice; partly a question of organizing better

farm business; partly a question of developing a better farm life. In a word, the rural problem consists in the improvement or progress of the rural people. Many forces may be invoked for this improvement, such as education, socialization, organization, even religion; but the problems are solved by men and women. Hence, the training of rural problem solvers is the main purpose of agricultural education.

2. *It should be Inclusive in its Human Reach.* — It will reach all ages, from the youngster in the grades to the graduate student in the college. It will provide for teaching to those out of school, both young and old. With respect to emphasis, it will serve chiefly the people who must make a living by farming; but it must also train specialists or professional experts. Nor will it neglect people of the city; many of them as well as the country folk need agriculture.

3. *It should be Broad in its Vocational Scope.* — It will deal at the bottom with the technical or productive process; but it will also concern itself with the management of the farm; lay large stress upon such economic questions as access to the land, credit, co-operation; and it will emphasize a fuller community life, through the home, health, recreation, beauty, morals.

4. *It should be Comprehensive in its Activities.* — Teaching is the backbone of any system of education; but research and experimentation are vital to good teaching, particularly in such subjects as agriculture. And then it will extend itself not only to the pupils in the schools, but to every person on the land.

5. *It should be Liberal in its Spirit.* — It will emphasize the dignity of vocation. Vocation is a means of social service as well as an opportunity to make a living. It will impress upon the student mind the idea that vocation is also both a means of intellectual development and a great factor in the building of individual character. Vocational education will recognize that the public schools must assist in fitting boys and girls for citizenship in the largest sense, as well as in giving them capacity to meet the problems of their personal life.

6. *It should be Complete in its Correlation of Parts.* — This is to some degree a question of the division of labor between institutions. It is also a question of administrative responsi-

bility clearly defined. It means co-operative planning among all the different institutions.

7. *It should be an organic part of the State educational system.*

II. Types of Work to be Recognized.

1. *Formal Teaching.* — Organized teaching in the schools is obviously the main feature in a conventional discussion of education, and it must have a large share of this discussion; but in agricultural education there are one or two other considerations that must receive much attention. Agricultural education has set itself the task of reaching the masses of working farmers. Manifestly, more informal methods than those which require steady attendance at school must be used in this gigantic task. Moreover, formal agricultural teaching that keeps fresh and effective feeds on the results of thorough scientific investigation. Before proceeding to outline a plan for agricultural teaching we must note briefly these related aspects.

2. *Informal Teaching.* — One of the most fruitful phases in agricultural education is that of informal teaching. It is the sort of teaching which is represented by the present extension work. It is stimulating largely because of close contact of the specialist with the man in need of some definite aid. Its present methods are personal visits, public lectures, correspondence courses and extension schools. Beyond doubt the most effective reliance of informal teaching is the demonstration. If people can see with their own eyes the achievement of a certain scientific principle actually applied, they are ready to try for themselves. All this informal teaching must be made very concrete and definite. It needs systematization. It requires the best pedagogical methods that we can devise.

Educational Work of Administrative Boards: There is another type of informal agricultural education that needs to be co-ordinated with the rest. It is carried on by certain State boards in order that their administrative efficiency may be developed. Oftentimes in the enforcement of a law the crucial thing is not to invoke the law, but to make the persons involved see clearly what the law is for, and to understand the results that are expected from it. Nine-tenths of law enforcement, with respect to certain public relations, consists in education

rather than in strict law enforcement. This function of the administrative boards ought to be perfectly understood by themselves as well as by the educational institutions; the two types of education should not conflict; they should be correlated in some definite fashion.

Educational Aspect of Voluntary Organizations: In discussing education we usually concern ourselves only with those agencies that are supported directly from the public treasury. But the many voluntary associations that exist serve their purposes largely because they are educational in their aims and methods. The grange is perhaps the best example. If we desire a well-rounded system of agricultural education we will endeavor to correlate the activities of both public and private agencies. The work of voluntary associations can often be organized and stimulated from the schools, though in no sense directed by the school. Study clubs in agriculture and in various phases of country life may gain in solidity and permanence of work if they can have assistance from some parts of the agricultural education system. Though informal and even unorganized, real education may result from the work of voluntary associations.

3. *Investigation and Experiment.* — These are important in all education; they are absolutely vital in a field of instruction where there are such large unexplored areas as is the case in agriculture. Agricultural science has had a rapid growth during the past quarter-century. Under the leadership of the United States Department of Agriculture and of agricultural experiment stations, a great body of knowledge has come into use concerning the soil, the cultivated plant, the domestic animal and their various relationships. But the wisest investigator knows that he has made but a beginning, and that we are still quite in ignorance of many of the most fundamental aspects of natural law as it applies to the practice of agriculture. Therefore we must go on with this study of nature's methods and laws, with better provision in men and money, and with better methods of applying the researches of the scientist to the practice of the working farmer.

Investigation cannot stop with the study of the physical and biological features of the farmer's problem. Great economic

and social forces are at work, and are either upbuilding or breaking down the structure of rural civilization, industrial and social. These forces should be studied, also, by experts, who can withdraw themselves apart for a time and go deeply into underlying causes and essential remedies.

We should inventory our agricultural resources and chart conditions. It is not enough that we study abstract laws — we must know the actual situation that the working farmer has to face, with reference to soil, climate, market conditions, labor supply, and, indeed, all those economic and social as well as physical factors with which the working farmer must deal. We have hardly made more than a beginning in this field of investigation.

III. The Groups of Persons to be reached in a State System of Education.

A careful study of our problem would classify accurately the various groups of people who should be reached by an adequate system of agricultural education. I can offer here only a rough and tentative grouping: —

1. *Pupils in the "Grades" of the Public Schools.* — The material which enters into agriculture in its simpler forms is capital material for general educational use among pupils ranging in age from eight to fourteen. They may profit thereby not because they wish to become farmers, but because they may gain a part of their education by means of agricultural school gardens, home gardens, nature study, poultry clubs and corn clubs; those various types of work with plants and animals that are the beginning of agriculture should become an organic part of our school system, and available to all pupils under fourteen years of age. It is hardly necessary to remark that manual participation is essential if the pupil is to gain real education from this source. This work may also be considered helpful "prevocational" preparation for pupils who later study agriculture as a life work.

2. *High School Pupils desiring General Agriculture.* — The opportunity for education by means of agriculture should be carried through the high school, with elective courses, finding a place alongside the other subjects in the course. The teach-

ing should be very concrete and practical, and should bring the pupils into working touch, not alone with these processes by which plants and animals and all nature's forces are subordinated to human uses, but with the processes by which the business and life of rural people are related to the business and life of the nation as a whole.

3. "*Boy Farmers.*" — We come now to those classes of pupils who are to be offered agricultural study rather definitely for the purpose of future vocational activities. The first group may theoretically comprise boys and girls under fourteen years of age. Personally, I question whether "vocational" agriculture should begin before fourteen. I have been impressed by the fact that Germany, as well as the other European countries which have patterned their educational systems after Germany, has declined to permit the serious study of vocational agriculture by boys and girls under fourteen years old. But in this country many States provide for vocational agriculture in the lower grades; we must recognize the possibility of a similar plan for Massachusetts.

4. *The Young Agriculturists.* — Numerically speaking, the most important group of pupils who should be provided with facilities for definite training in agriculture for vocational purposes are those between fourteen and seventeen or eighteen years of age. In an adequate system of agricultural education it is quite obvious that a vast majority of those persons who secure a schooling in agriculture will get that schooling in institutions that provide for them before they are eighteen or nineteen years of age. The facilities for this group will be two-fold, first, agricultural departments of public high schools more or less highly differentiated, and second, a system of county, district or special schools. The "Junior Extension Service" of the agricultural college, which if fully developed will be an expansion of the present successful system of our boys' and girls' agricultural clubs, promises to be of great value also. Moreover, it has been proved that a course in agriculture or home economics given one hour a day for four years, in connection with other high school subjects, can be made to yield remarkably successful training for boys and girls preparing for agricultural practice and rural home life. But I predict that the

Massachusetts plan of agricultural departments, in which the pupil gives about half his time to agriculture, will become a very important and vital part of our State system of agricultural education — perhaps in some respects its characteristic feature — so far as pupils of high school age are concerned.

5. *Candidates for County Agricultural Schools.* — I believe in the county or district agricultural school, and that a complete system of agricultural education in any State must provide for a number of these schools. There are objections to them. They are rather expensive. If great care is not taken they may encroach upon the work of the agricultural college. It is sometimes said that if they are boarding schools they will take away the boys and girls from home at too tender an age, and if they are not boarding schools the area of their influence is limited. The county agricultural school in Essex County, while not a boarding school, reaches a very large constituency. I think, however, that it is a serious question whether a county school of agriculture ought to give a four-year course, except as an expedient during the early years of the development of a system of agricultural education. Its final place in the system of agricultural education is likely to be in advanced and specialized work for pupils of high school age who have had perhaps two years in the agricultural department of the high schools, or for those who have finished the work of such a department, but are not prepared for college. One advantage of the county agricultural school is that it may have a faculty of from six to twenty teachers, whereas in most cases the agricultural department of the public high school will have not over one teacher, or at most two or three teachers. These two types of schools should not in any way compete, but should complement one another.

6. *The College Student of Agriculture.* — There is next that group of pupils from eighteen years upward who will attend the agricultural college. Many of these will go back to farming; others will go into expert service in connection with agriculture. Sometimes the agricultural colleges are criticized because they do not send more of their graduates directly back to the farm. On theoretical grounds, and judging from the experience of agricultural colleges abroad as well as in this country, I should

say that we might consider ourselves fortunate if 40 per cent. of our graduates go back to the farm. There are perhaps another 40 per cent. who will go into agricultural vocations not connected with the farm, such as teaching, experimentation, county farm bureau work, agricultural journalism, and those business fields that have some connection with agriculture, such as farm machinery, the fertilizer business, etc. Probably there will always be a number of students graduating from an agricultural college who will never be directly connected with agriculture, for this is precisely what occurs in nearly all professional schools, including law and even medicine. But in the main the agricultural college is to be considered a professional school, or at least a semi-professional school, and it is here that there is an opportunity for the training for leadership in solving the larger problems of agriculture and country life.

7. *The Graduate Student.* — In connection with the agricultural college there is room for the development of a graduate school of agriculture. Not only room, but great need, for neither research nor teaching can be vitalized or pushed to its full measure of development unless constantly reinforced by men of the highest training.

8. *The Demand for Short Courses.* — In common with other agricultural colleges, our own has maintained for many years winter short courses, and, for a somewhat more restricted period, summer short courses in agriculture and country life. I am convinced that the time has arrived when these short courses must be developed more fully and fitted more completely into the State system of agricultural education. The men at the head of the agricultural departments of our public high schools, and especially those who are connected with the county agricultural schools, are thoroughly convinced that many of the pupils of these schools wish to attend an agricultural college for a period of from three months to an entire year, for the purpose of coming into contact with the recognized authorities in the various agricultural specialties that are emphasized in a well-regulated agricultural college. To such pupils this work would be a sort of graduate course. It would bring them into contact with the wider reaches of the subject, with the best prepared teachers, with the largest equipment,

and with the most complete resources for agricultural investigation and instruction. There are, moreover, a great many adults who would like special work in summer or winter who cannot take our regular courses. I am quite sure that we have not yet solved this problem; we have not yet given sufficient thought or attention to the working out of a system of short courses which will meet the needs of an increasing demand, and which at the same time is practical from the standpoint of college administration.

9. *The City Man and the Soil.* — In a State like Massachusetts, where the urban population constitutes nine-tenths of the people, there is rapidly coming on a demand for agricultural instruction to persons who are not immediately connected with agriculture, and perhaps who do not intend ever to be connected with agriculture as an industrial pursuit. The Homestead Commission has aroused interest in the problems of teaching agriculture to families, in the development of garden cities and in vacant-lot cultivation in the cities. It would appear that in this country, as in many of the more thickly populated countries of western Europe, there is need of a training which will give urban people a chance to work the soil, probably chiefly as an avocation, and yet to get something out of the soil which will help them in maintaining their families, and in rearing children to a healthy manhood and womanhood. There is also an increasing number of men and women, both among the wage earners and among the salaried men in the cities, who wish to become farmers, but who cannot take advantage of present institutions for agricultural education. We must assist these in some way.

10. *A Schooling for the Youth at Work on the Farm.* — In spite of all we can do through institutions, through formal schooling, there will always be a very large proportion of youths out of school who still need, and will take advantage of, some plan for continuing their agricultural education beyond school days. We need, then, extension schools in connection with our public school system, chiefly, perhaps, in connection with agricultural departments of public high schools and with the county agricultural schools, which shall during the evenings of the long winter give very definite instruction in agriculture, home eco-

nomics and country life to the boys and girls who cannot attend the regular day school. I am not sure whether we can ever adopt the plan used in some European countries, of requiring attendance at these schools; perhaps we may. At any rate, we can give the opportunity. Continuation or half-time courses in agriculture are also worth serious consideration.

11. *The Man in the Furrow.*—What has been said with reference to youths is even more true of adults. The extension service of the agricultural college has demonstrated the hunger for information that exists among the great masses of the people, and this work must be kept up, organized, systematized and better related to the other agencies. These adults will also be reached more or less by the administrative boards already referred to.

IV. The Scope of Agricultural Education.

I wish to lay added emphasis upon the fact that in developing a proper system of agricultural education we must get away from the old idea that agriculture is chiefly a matter of production. Primarily it is such. We must know the soil and other physical factors; we must know the plant and the animal; we must understand all physical and biological forces and their application to the task of producing food and clothing. But this is not all there is of agriculture, or even the chief part of agriculture; it is merely the foundation. We cannot expect individual success on the farm, nor a prosperous agricultural class, nor an adequate rural civilization unless other things than production are taken up and developed in our system of agricultural education. The distribution of agricultural products, the question of farm marketing, individual and co-operative, the question of buying supplies, the matter of credit, the investment of the surplus, protection against pests and foes, insurance — all are parts of a great problem of agricultural economics that should not be ignored, but should be worked in as a part of the system of agricultural education from the bottom to the top.

Our people who farm are still men and women. They live a common neighborhood life; they have their homes; they have their schools; they have their churches; they have their rec-

reations; they must be in good health; they must have all of those things that go to make life worth living. Now these items should be subjects of education; they should be taught to youth from beginning to end of the school period — in their simpler forms to the young, and in a more complete way to the older pupils. In our agricultural education thus far we have placed the emphasis upon production, we have minimized distribution, we have ignored community life. We have given our attention to the foundations; we have neglected the superstructure. Unless we are very careful the superstructure will be one-sided and incomplete, and we will not have those results from large expenditures of money for agricultural education that a Commonwealth has a right to expect.

It is generally conceded that agricultural education should include home economics. The work as at present developed, however, is rather narrow in its scope and restricted in the area of its operations. The phrase "rural homemaking" hints at the real need and objective. This work should be developed as rapidly as possible, and should everywhere virtually parallel the work in agriculture.

One who has been fascinated by the wonderful results achieved in the Danish folk schools, or "people's high schools," cannot resist the temptation to suggest that in organizing a system of agricultural education consideration be given to the patriotic and even the vocational results of those studies that have nothing to do with agriculture itself. Danish educational statesmanship recognized the fact that intelligent and ardent lovers of a new Denmark, dependently rural, would be the bulwark of a real rural civilization. Studies of Denmark's history, literature, aspirations have produced a group of farmers who see the national implications of a successful and permanent agriculture, and a satisfying farm community life. There is a lesson for us in this experience of the best organized agricultural country in the world.

There is one thing more. Agriculture cannot be more efficient unless it is better organized. We have heard so much in recent months about organization in connection with some of the nations at war that perhaps we are shy of it. We are all rather individualistic, and slow about tying ourselves up with

overhead organizations. It is true that we must not subordinate the individual; we must not subordinate the separate institution. We must allow for initiative and energy and all of those things that spring out of the glorious spirit of individualism. But the day has gone by when an individual or an institution can work by itself in a corner. It is so with agriculture. The task of organizing the farm, the farm home, the local rural communities, and the educational work of a State, the development of a national system of agriculture and country life, are tasks in rural organization. These things must be presented to the pupils in our agricultural educational system just as soon as they are capable of understanding. They must appreciate the spirit of co-operation; they must see the promise of organization; they must learn how to co-operate with other individuals and how to correlate other forces and institutions. This organization has to do not only with publicly supported institutions, but also with privately supported institutions like the grange. Let us give the broadest possible scope to our system of agricultural education.

V. A Suggestion concerning the Necessary Machinery for Agricultural Education.

Up to this point I have been endeavoring to formulate a few general principles. Let us pass to a brief outline of the system of institutions that seem to be needed in order to secure the full measure of agricultural education. This statement is made with hesitation, and its purpose is to make concrete the subject which we have been considering, and to offer a suggestion which may possibly form the basis for a definite program and policy:—

I. The Public Schools.

Presenting agricultural material as one means of education; through —

1. Boys' and girls' agricultural clubs: supervision by farm bureaus and the college.
2. School subjects: nature study; elementary agriculture (?).
3. Courses in agriculture in the high school: three to five hours per week for one to four years.

II. The Public School.

Teaching agriculture for vocational ends, through —

1. Agricultural departments of the high school: to reach pupils fourteen to sixteen years of age and sixteen to eighteen.

2. Continuation and extension schools: in connection with public high schools, to reach pupils no longer enrolled in the public schools, ages fourteen to eighteen.
3. Agricultural education for families, as proposed by the Homestead Commission.
4. The public schools as centers for extension work in agriculture and country life, carried on by the farm bureaus and the college.

III. *County or District Agricultural Schools.*

1. General and specialized agriculture: temporarily for boys fourteen to eighteen.
2. Specialized courses in agriculture, such as poultry husbandry, dairy husbandry, pomology, etc., as the eventual purpose for boys sixteen to eighteen; these courses correlate with the work of the agricultural departments of the high schools.
3. Extension work, in co-operation with the county farm bureaus and improvement leagues; this should be co-ordinated closely with the work of the county schools on the one hand, and with the agricultural college on the other.

IV. *The Agricultural College.*

1. Investigation.
 - (a) Research.
 - (b) Experimentation and testing.
 - (c) Co-operative studies in agricultural resources.
2. Teaching.
 - (a) The four-year course for a degree.
 - (b) Graduate work.
 - (c) Short courses for pupils of eighteen years and upwards.
 - A. Short courses of college grade, one to two years.
 - (1) For graduates of county agricultural schools.
 - (2) For graduates of agricultural departments of high schools.
 - (3) For graduates of high schools who have not had agriculture and are not eligible to the four-year course.
 - (4) For graduates of liberal arts colleges.
 - (5) For adults twenty-one years and over not eligible to four-year course.
 - B. Short courses giving elementary and specialized work, if the demand requires, for those eighteen years of age and upward.
 - (1) Winter course of twelve weeks for highly specialized work, such as butter making, etc.
 - (2) Winter course of twenty weeks for students desiring more general work.
 - (3) Summer course of six weeks, primarily for teachers of nonvocational agriculture.

3. Extension Service.

(a) General extension work for adults.

- (1) Lectures and study clubs.
- (2) Extension schools.
- (3) Correspondence courses.
- (4) Demonstrations.

(b) Junior extension work.

(c) Extension work for urban and suburban residents.

Note. — It is understood that so far as possible work in rural home-making will parallel agricultural work throughout the whole system.

VI. Administration.

It is important to determine the proper administrative authority for the different lines of work, and how they may be correlated. I have no ready-made scheme to propose. The following suggestions may perhaps be helpful: —

1. Local school committees, or specially organized boards, should manage the agricultural work of the public schools, including the agricultural departments. Of course there will be special boards of control for county or district agricultural schools.

2. The State Board of Education represents the Commonwealth in guidance of its system of public education. I am not prepared to suggest a precise definition of the Board's functions in relation to the supervisory details of the agricultural phase of the system.

3. The various other State-supported boards, such as the Board of Agriculture, the Department of Health, etc., should be chiefly administrative bodies, and their educational work should be directed towards the carrying out of administrative functions.

4. The county farm bureaus, each in its own jurisdiction, will manage their distinctive enterprises. But their work is so intimately connected with that of all other agencies participating in a system of agricultural education that the closest correlation is essential.

5. The voluntary associations are under no legal obligation to co-operate with publicly supported agencies. In the interests of the rural people, however, they should endeavor to

correlate their work as far as possible with the public system of agricultural education.

6. The function of the agricultural college, aside from that of its recognized work of investigation, teaching, and extension service, should consist, in general, in being the main source of material and methods with respect to the teaching of agriculture of all grades. The leadership in this line should not be forced or perfunctory, but should lie in recognized efficiency and capacity to lead.

In this connection the preparation of teachers of agriculture becomes of vital concern. Undoubtedly normal schools can do a good deal, particularly with respect to teachers in the grades; but I think the work of the agricultural college in training teachers of agriculture for all grades should be more adequately developed.

VII. A Word of Recommendation.

I have discussed this subject because of the belief that the time is ripe for action with respect to establishing an adequate system of agricultural education for the Commonwealth. The college has direct relationship to the whole matter. I have explained that this discussion is in no measure complete, much less conclusive. It is meant to be suggestive only; it is hoped that it may be fruitful. The question is so important that I recommend that your Board request its committee on course of study and faculty to take such steps as in their judgment may be desirable to assist in the formulation of plans for a State system of agricultural education, and in better fitting the work of the college to the requirements of the system as a whole.

KENYON L. BUTTERFIELD,

President.

REPORTS OF OTHER ADMINISTRATIVE OFFICERS.

IN THE DEPARTMENTS OF INSTRUCTION.

The Dean.

In any year the work of the dean's office consists mainly of the supervision of absences and of scholarship. Probably three-fifths, if not two-thirds, of its time is devoted to this work. The remaining time is taken up with cases of minor discipline, conferences and correspondence. So it was during the past year.

The scholarship problems center in the first two years of the course. If the student gets a good start and does the work of these years fairly well he seldom gets into difficulty. The really crucial period for him in many respects, however, is the first semester of the first year; the transition from the ways and atmosphere of the preparatory school to those of college is not always easy. Recognizing this fact we introduced last year, at the suggestion of President Butterfield, a system of personal supervision of the boys who were making a bad beginning, and placed them in charge of Professor Machmer. He did his work so well, I am glad to say, that comparatively few freshmen failed at the end of the first semester. Much praise is due Professor Machmer for his splendid work and its happy outcome. We shall without question follow a similar plan next year.

I had hoped to be able to place before you at this time a statistical statement regarding some phases of scholarship and of absences, but Miss Christiansen's retirement has made it impossible this year. For compiling reports concerning minutiae and details of the dean's office we need more help. The growth of the college and the consequent accumulation of data is felt as keenly in this office as in any other administrative office on the college grounds.

The fundamental and persistent problem of our office is, and always will be, I presume, the scholarship problem. Essentially, however, that is a faculty problem, and must in the last analysis be solved by the joint action of the teaching corps.

EDWARD M. LEWIS,
Dean.

The Director of the Graduate School.

From Sept. 1, 1914, to Sept. 1, 1915, the total number of students enrolled in the graduate school was 56; of these, 16 registered for the degree of doctor of philosophy, 27 for the degree of master of science, and 5 for the degree of master of agriculture. Eight registered as candidates for no degree. The number of students who have enrolled since the opening of the present college term is 52. At the last Commencement the degree of doctor of philosophy was conferred upon 5 candidates and the degree of master of science upon 5.

During the year the Board of Trustees voted to establish the following graduate courses: master of science in agronomy, master of agriculture in agronomy, master of science in animal husbandry, master of agriculture in animal husbandry.

The general plan of organization of the graduate school, which was adopted a year and a half ago by the trustees, is proving to be adequate and satisfactory in every respect. The number of graduate students attracted to this institution is very gratifying, and it is found that men come here from the very best educational institutions in the country.

Every two years there is held, under the direction of the Association of American Agricultural Colleges and Experiment Stations, a graduate summer school of agriculture. In 1916 this summer school is to be held at the Massachusetts Agricultural College. The director of the graduate school is serving as assistant dean of the summer school of agriculture, and is engaged in formulating plans for the school next summer.

CHARLES E. MARSHALL,
Director.

The Division of Agriculture.

The completion of Stockbridge Hall, offering as it does much needed facilities and equipment for the work of the different departments, marks this as a red letter year in the growth of the Division of Agriculture. The Departments of Agronomy, Animal Husbandry, Farm Administration, Poultry Husbandry and Rural Engineering have headquarters in the building, thus allowing the use of Flint Laboratory for the Dairy Department as originally planned.

During the year there have been two resignations in the Department of Animal Husbandry; first, Mr. George E. Story, the extension instructor, resigned to accept the position of head of the Department of Animal Husbandry at the University of Vermont. His going is a distinct loss to the institution as well as to the many friends he has made in his work throughout the State. His place has been filled by the appointment of Mr. W. F. Turner, who comes to us with five years' experience since his graduation from the Kansas Agricultural College, and who will begin work about December 1. The second resignation was that of the head of the department, Associate Professor J. A. McLean, who left us to take up extension work in the public service department of the Quaker Oats Company. His work will be largely in New England with headquarters in Boston, so that we look for his continued co-operation. His place at the college has been filled by the appointment of Prof. John C. McNutt, who will begin work Jan. 1, 1916.

An assistant professor of dairying and an instructor in farm administration have been added to the staff, as noted elsewhere.

The Department of Farm Administration has continued the farm management and survey work in co-operation with the Federal government and other State agencies.

On the farm, the drainage and improvement of the Nash property has continued as time and money would allow. The enforcement of the Saturday half holiday law will increase the labor expense of the farm at least 10 per cent., without a corresponding income to offset it.

Among the most pressing needs of the division are the remodeling of the farm dairy, an addition to the rural engineering laboratory, land for the research work in poultry husbandry and for a young stock pasture, and a small appropriation for an irrigation plant and modern farm tools. Most of these were mentioned in the last annual report. There is no question of the need — each month makes it more urgent.

One of the serious problems before us is how to satisfy the increasing demands of the college and extension work, and still allow the members of the staff sufficient time for study and research in order that they may keep abreast of the times in their respective subjects. This is an essential if the institution is to hold its place among others of the same class. The question of salaries is also very important. A bad break in the work occurs whenever a change in personnel is made, and often a financial increase is necessary in order to secure the same grade of service. Salaries should certainly be equal to those paid in other institutions, especially for heads of departments.

J. A. FOORD,
Head of the Division.

The Division of Horticulture.

The Department of Market Gardening has been partially reorganized, Prof. H. F. Thompson coming to the nominal position of head of the department, but with his principal duties in the field in eastern Massachusetts. Prof. A. S. Thomson has become assistant professor in market gardening, doing the resident teaching. Prof. C. H. Thompson has been put in charge of courses in Horticulture 2, 3 and 4. This constitutes a substantial addition to our teaching staff. The resignation of Mr. P. H. Elwood, Jr., on September 1 takes from us a man who had proved very valuable in civic improvement extension work. His place has not yet been filled. No important changes have been made in courses, equipment or policies during the year.

There are many pressing needs in the Division of Horticulture, and it is hard to make a list of those which should be particularly emphasized. At the present moment the following

seem to be most important: (1) The establishment of work in horticultural manufactures on a firm basis (this involves the erection of a suitable laboratory and the employment of a specialist in this field); (2) an adequate tract of forest land for the Department of Forestry; (3) further organization of the Department of Market Gardening, including the establishment of an out-station in eastern Massachusetts; (4) additional greenhouses; (5) an additional extension man in pomology.

At the present moment we are looking forward with much interest to the establishment of summer instruction in certain departments of the division. We believe that this will mark a radical change for the better. At the same time it will raise many practical questions, and will require the earnest effort of our instructors to adapt our instruction to the changed conditions.

We still believe that the problems involved in better methods of technical instruction are those to which we must give our immediate and earnest attention. The grounds service has grown so rapidly during the last three years that it now presents very serious problems, especially in the matter of adequate financial support. I have already presented a special report on this point.

F. A. WAUGH,
Head of the Division.

The Division of Science.

In botany, during the absence of Dr. Stone, the department has been in charge of Professor Osmun. Some minor changes in methods of presentation of the courses have been made, with excellent results. Dr. P. J. Anderson has proved a distinct addition to the staff, and Mr. Doran has taken hold well. In chemistry the classification of the freshmen into two divisions — those who have and those who have not had chemistry before entrance — has worked well, but has produced difficulties in scheduling. The advisability of requiring chemistry for entrance is being considered. In entomology the year has been one of marked progress in the grade of work done by the students. Dr. Regan has proved a most excellent teacher and has greatly strengthened the department. In mathematics

fairly satisfactory results have been attained, though eight sections of freshman have been made necessary by the large number in the class, and this has pressed the staff very hard. Microbiology is looking forward with much anticipation to its new laboratory and greater facilities, but has done its best under present conditions. In the Veterinary Department the work has gone about as usual, about fifty men now being given instruction. In zoölogy the work has been much as heretofore. Seven subjects are being taught.

Immediate and pressing needs in the division may be listed briefly as follows: —

In botany a careful revision and co-ordination of the courses. Proposals for this are now in the hands of the faculty committee on course of study. More students are taking botany, and with the enlarging of the scope of some of the courses, additional help will be needed; in chemistry a new building is the most pressing need; in entomology more shelf room in the library is much needed, as are some binocular microscopes. It is hoped that some of these new microscopes, which have practically quadrupled possibilities of work, can be obtained in the near future. A honey bottling equipment is greatly desired for beekeeping work. In mathematics the professor in charge believes that trigonometry should be transferred from the Department of Physics to that of mathematics where it logically belongs, in the interests of greatest efficiency. Large classes in plane surveying make the need for more transits and levels imperative. The most pressing need is for a major in the applied subjects of the department, so that these may be taken in a correlated way. At present the hour schedule is based on majors, and breaks into correlated work in mathematical subjects. The building used should be heated from the power plant. In veterinary science a thorough, well-taught course in animal physiology would greatly help all the science teachers. "Under our present arrangements conditions are far worse, as regards the subject of physiology, than they were formerly."

Some of the fundamental problems of the division may be mentioned: the problem of giving all students a sufficient understanding of chemistry to serve them well in their life vocations, and the securing and training of a few bright men

for investigations in agricultural chemistry. In entomology the fundamental problem is, as always, to get the best work out of the students. I think there has been some gain in this during the past year.

The fundamental problem which applies to this entire college and to all others as well, as I see it, is, in this time when supply is rapidly approaching demand, to make students realize that it is the fittest which survive, and that ability being equal, a student who really gets the most from his course is the man who will win; also, how to insure that a technically trained man shall be generally cultured as well.

H. T. FERNALD,
Chairman of the Division.

The Division of the Humanities.

The courses remain practically as they were last year. The English Department is becoming better regulated, and therefore stronger work is being done. The most pressing and most fundamental needs of the humanistic courses are permanence of location on the campus, with as much concentration of work in the same building as possible, and thorough equipment of classrooms for good instruction. The instructors in this division are the nomads of the campus, drifting from building to building and adapting themselves as well as possible to the temporary conditions over which they have little control. Such wanderings are not conducive to the best instruction, and make the best methods of class work well-nigh impossible. When the instructor does not have a recognized status in the building where his classes are held he neither feels like proposing changes to suit his needs nor would he in all cases be permitted to carry them out. I believe that as soon as these needs shall be met for the division there will develop a better quality of work and a stronger atmosphere of scholarship.

R. J. SPRAGUE,
Head of the Division.

The Division of Rural Social Science.

The work of the Department of Agricultural Economics has been carried on along three lines during the past year — the regular classroom instruction, extension work and the investigations. The extension work of the last year has been most gratifying; it has included the organization and supervision of co-operative associations, seventeen of these societies having been organized within the State during the last two years. The marketing of farm produce has also received much attention. Two special investigations have been conducted, one of these a very complete study of the marketing of milk in Massachusetts, the other a study of the methods and costs of the distribution of onions, with especial reference to the crop of the Connecticut valley. Reports of both of these investigations are nearly ready for publication.

The work in the Department of Agricultural Education has continued along the lines already started. The head of the department states the following as representing the most pressing immediate needs of the department: (1) office facilities, (*a*) for the clerical work connected with the boys' and girls' clubs; (*b*) for private consultation with students; (2) teaching opportunities for those intending to teach; (3) enlargement of scope of the work by the introduction of a two-year training course for rural teachers; (4) building for carrying on experimental teaching and teacher-training; (5) additional help, (*a*) one person to take charge of the four-year college student in training for teaching; (*b*) one person in charge of the two-year training course for rural schools; (*c*) one person to take charge of the office management of the boys' and girls' clubs.

During the past college year the Department of Rural Sociology was virtually without a leader, owing to the resignation of Professor Eyerly, which took effect in August, 1914. The fact that the department had no administrative head was a real handicap in the development of the work as well as in the attraction of students to the department. This fall, however, Prof. John Phelan assumed the headship of this department, and is conducting the work in a most satisfactory man-

ner. The courses of study are now being revised, and outlines are being prepared for graduate work in the department.

KENYON L. BUTTERFIELD,
Head of the Division.

General Departments reporting to the President.

MILITARY DEPARTMENT.

War department orders state that instruction in all educational institutions, at which an officer of the army is detailed, must include instruction in the infantry drill regulations, field service regulations, and small arms firing regulations; it may be said that cadets will be taught to drill, to scout and to shoot. With the beginning of the present scholastic year a more systematic system of imparting these three fundamentals has been inaugurated by which the student in his freshman year is placed in companies that are given close and extended order drill; the sophomores in companies that receive training in field problems; the juniors in companies that, under careful coaching, are taught to shoot and to control and direct the firing at field targets. The training for all is made as intensive as possible. It has been very noticeable that these changes have done much to hold the interest of the students, which is very important. During the winter months the theoretical instruction will go on varied by lectures by prominent officers of the regular army and the Massachusetts militia. It is considered very important that the students should have sound and correct ideas of the aims, purpose and necessity of the army, and the necessity for proper military organization, including not only the troops with the colors, but necessary reserves.

At the present time the outdoor work is handicapped by a drill hall that was built about thirty years ago when the college had an enrollment of about 150. On one rainy Wednesday this fall I had the regiment form inside the hall, but the room was so crowded and poorly ventilated that it was necessary to dismiss four of the eight companies. The armory and storage rooms are as inadequate as the hall. The drill hall is doing

duty as a gymnasium, also, and much as we need a new hall, I feel that the student body would be more benefited by a new and modern gymnasium than any building that could be erected on the campus.

Not until this year has target practice been made a part of the regular outdoor instruction. The range is a little over two miles from college. There are five double targets. About one and one-half hours are spent in going and coming from the range. This leaves about one and one-half hours to shoot. Barely five shots per man can be fired each week. With five more targets this important instruction could be more than doubled. A handicap to efficient work is the arrangement of the course of study in the Military Department, which requires theoretical instruction for only the freshman and sophomore classes, and not the juniors and seniors. The result is that there is no opportunity to teach the cadet first sergeants and lieutenants (juniors) and the cadet captains and higher officers (seniors) their duties, except on the drill ground. The proper carrying out of orders rests on these men. A company of 150 men in an attack must be drilled in signals almost as thoroughly as a football team, and with the few hours we have a week for drill the place for this instruction is the classroom. One of the remarks of Captain Schindel on the inspection of a field exercise last spring was, "There was almost a total lack of team work."

It would seem that the real aim of the military work should be to fit the graduate for his duties of citizenship for the military service in case he should be needed. Heretofore there has been no practical way to utilize this knowledge; a future war was a vague and far-away idea that did not appeal to the undergraduate, and the main object of the Military Department being kept on the same efficient basis as other departments of a college was that any inefficiency was prejudicial to all. The proposed colonial army, many details of which are still unpublished, is evidently based on the results of college camps. War Department orders state that "the main object of military instruction given at civil institutions is to qualify students to be company officers of infantry volunteers or militia." There will be a great dearth of officers for the 133,000

men it is proposed to raise next summer. I believe that I will be able to get for the twelve cadet officers of the senior class an appointment, after examination, as second lieutenant in this proposed colonial army, should they desire it, which office would pay \$155 per month while with the colors. It may be that many of the underclassmen may enlist with the idea that from their experience they will be made noncommissioned officers, which offices would pay from \$30 to \$60 a month. Should this legislation pass, it would be a great stimulant to the military work in all colleges and tend to standardize the work. .

H. W. FLEET,

Professor of Military Science and Tactics.

DEPARTMENT OF PHYSICAL EDUCATION AND HYGIENE.

The work of the department has been conducted through the year along the following lines: —

1. Each student in the entering class was given a physical examination during the first month of the college year, thus reducing the possibility of any injury arising from ignorance. In the examination especial care was taken to detect any defects of the vital organs, sight and hearing. Each person is given a short talk following his examination concerning his condition, the kind of exercise he should have, and the proper care of his body.

2. The freshman class was given a course of lectures and written quizzes on personal hygiene during the first semester.

3. For the past few years the department has been giving first aid in cases of minor injuries or illness, advising the calling of a physician when necessary, and seeing that all ill or injured students are properly cared for. Beginning with the opening of the college in September we have had the use of the new infirmary. This has increased the efficiency of our work and in every way raised the standard of service to the student. In all this work the department has been in constant touch with the Department of Microbiology through the health committee of the college.

4. During the winter months the department requires three hours of physical exercise per week for each member of the

three lower classes. Those men who have been found by physical examination to be physically normal are permitted to elect one of the several athletic activities; those who have been found to be below normal physically are given individual instruction in so far as our present equipment will permit. Walking trips may be substituted for physical exercise in the gymnasium, and during the past year from 150 to 200 students have elected this form of exercise. The work of the indoor classes of from 30 to 40 men each consists of gymnastic exercises, such games as basketball and indoor baseball.

The physical director is general manager of athletics, supervising arrangements for contests with other colleges, buying supplies for the teams, assisting in the coaching, and having final control over players and games.

The interest in intercollegiate and intramural activities has been steadily growing. An accurate estimate of the participation in all sports during the year shows that in track about 75 men participated; cross country, 50; hockey, 75; baseball, 175; tennis, 25; football, 140; and basketball (other than required gymnasium), 40. After counting out duplications we find that approximately 50 per cent. of the student body voluntarily took part in some form of supervised athletic sport during the year.

The new athletic field is so far toward completion that it was possible to use it for college games last fall. With the opening of the spring this whole field of nearly 8 acres will be thrown open to general use, and should offer a greater inducement than anything we have had before for universal participation in outdoor sports.

The limited quarters in which the regular gymnasium work is to be carried on in the winter season make it impossible to do indoor gymnastics which can compare in anywise favorably with those of other colleges. From December 1 to April 1 the drill hall floor is in almost constant use from 8 o'clock in the morning until 9 o'clock at night.

The immediate pressing need of this department is a suitable gymnasium for the physical training of students during the winter months. Every student should receive gymnastic instruction and training of such a nature as to keep his physical

education and development on a par with his mental development. Many of our students who should receive individual attention and treatment are neglected simply because the present building is too small, unsanitary and poorly equipped. A suitable gymnasium with a swimming pool is our greatest need.

The greatest problem of this department is to provide means for our students to follow out the exercises prescribed for them, and require those who are not themselves inclined to take exercise to take some form of systematic exercise at least three times a week. With the completion of the athletic field our ideal of having every student taking part in some form of active exercise may be realized for at least half the year, but during the winter months, when there is no military drill and regular exercise is a necessity, we are confronted with the problem of finding forms of exercise which are possible with our present equipment.

CURRY S. HICKS,
Physical Director.

THE LIBRARY.

In spite of our very crowded conditions and the increasing number of teachers and students making use of the library, the past year has been one of marked interest. The adoption of the fundamental library policy of making the main catalogue in the college library a complete inventory of all the book resources of the institution will always count for the best library interests. The establishment of the agricultural reference library in Stockbridge Hall will mean a great deal toward strengthening all agricultural activities, and also make the new building better equipped to meet the demands which will be made upon it.

The work of recataloguing the library has continued without serious interruption. The new card catalogue contains 69,956 cards for 24,674 old books recatalogued, and 14,141 new books added since April 1, 1910.

Including several sets of scientific periodicals which have been made complete or added to the library during the past year there have been added 4,005 volumes regularly accessioned and catalogued. This shows a total of 48,411 volumes, 20 per-

cent. having been added to the college library during the past seven years, and indicating somewhat the recent growth of the department.

Library extension work means more to us than ever before; 572 books and 106 bulletins have been loaned out to 33 borrowing libraries throughout the State, and a large number of letters have been written to library officials and others in regard to the purchase of book material. Five library leaflets on farm and garden papers, books for young gardeners, farm women and fruit growers, and country-life books for teachers have been published and distributed in various ways. The school for library workers which was held here as part of the summer school proved more successful than was anticipated. Seventeen full-time and 8 part-time registrations indicate somewhat the interest in the first school of this kind held in connection with any agricultural college. We hope to continue and enlarge upon this line of activity.

Of greater importance, however, than anything referred to above is the need for a new library building. I understand that the president will deal with this matter at some length in his report, and I will only say that just as long as we continue in our present crowded and otherwise undesirable quarters just so long shall we fail in our best service to the teachers and students who come to us for assistance.

CHARLES R. GREEN,
Librarian.

The Supervisor of Short Courses.

The short courses given at this college have continued to draw not only a large number of interested people, but also many students who have had the advantage of attendance at some of the finest colleges and universities of this and other countries. The cosmopolitan nature of the groups making up the short courses is such that more than ordinary credit should be given members of the teaching staff for their successful efforts to adapt their courses to the understanding of some who have had practically no educational advantages, to others with the finest of collegiate training, and to business men with keen

powers of discernment and years of experience, making their teachings acceptable and satisfactory to all.

Due to the prevalence of the foot and mouth disease it was deemed wise to cancel all short courses between March 1 and the end of the college year, so that farmers' week, the school for town officers (arranged for the first time), tree wardens' school, Polish farmers' day, conferences of feed dealers, seed dealers, fertilizer agents (which were contemplated), and the beekeepers' course and convention were not held. This accounts for the falling off in statistics given later for this year.

A. WINTER SCHOOLS.

In the ten weeks' winter school of 1915, 24 courses were offered in agriculture, horticulture, the allied sciences and in rural social science.

The school for apple packing, held in November, 1915, was attended by 19 men and women. No doubt larger numbers will desire to take advantage of this another year, after the State apple packing law goes into effect.

It is to be hoped that the plan of inviting feed dealers, seed dealers, fertilizer agents, milk inspectors and other persons interested in the various phases of agriculture may be consummated, and that by so doing, station, college and commercial interests may meet for a free and frank discussion of problems of mutual interest, and that a better working understanding will result from such gatherings.

The registration in the winter school is so large that additional assistants should be placed in several departments having the largest registration during the short course work, but funds available at present do not permit of this.

B. SUMMER SCHOOLS.

Forty courses were offered during the summer school of agriculture and country life.

The regular summer school in spirit and application was probably the best that we have ever held.

For some unknown reason the attendance at the school for rural social service was not as large as usual. Every effort

during the past two years has been made to strengthen these courses and to provide work which would appeal to those interested in the broader phases of rural life.

The school for library workers, held for the first time, was a success. Twenty-five people attended and were evidently greatly helped by the work given. This was probably the first school of its kind to be held in connection with an agricultural college, and should be continued next year.

The agricultural camps, four in number, continued to be popular, and we believe that these have a lasting effect in impressing the boys and girls in these camps with a true conception of the magnitude and importance of the agricultural industry. The third boys' camp was made up of those who won third prize in the various State-wide club contests. A girls' camp, under the direction of Miss Nash, made up of the third prize winners in the home economics clubs, was held at the college for the first time this year. We ought to secure before another summer, if possible, enough 8 by 10 khaki tents to shelter those who attend these camps. The expenditure would probably be about \$200. The large fair exhibit tent is not storm proof, neither does it give the best possible conditions for camp discipline.

The poultry convention continues to enlist the interest of a large number of poultry men. More than 600 attended this year.

The conference on community planning was even more successful than usual. I am told that more than ever before this took on the nature of a real conference. Several of the official as well as voluntary organizations assisted in the furnishing of speakers, bringing the conference to the attention of a large number of people, and in other ways helping to make it a success.

Plans are under way to correlate all of our summer school activities during the summer school of 1916 with those of the graduate school of agriculture, which is to be held at the college.

RECOMMENDATIONS.

With additional funds to carry on the work and to give needed assistants to departments which are now already over-worked, there would be many things which might be recom-

mended, but which at the present time are entirely out of the question. Some of these are:—

1. The short courses of the institution arouse the interest of a large number of mature men and women throughout the State, and may serve a very useful purpose in helping them properly to organize their farming and to teach them the latest and best practices. These people also become loyal supporters of the college. The short courses ought to be enlarged, so that all those who desire to come may secure satisfactory work.

2. Special arrangements should be made for the admission of students in the senior year, or those who have finished courses at the county schools of agriculture. Unless this is done these schools will be compelled to spend large sums of money in duplicating equipment already in existence at the college.

3. The time has come when progressive short courses, covering two and even three winters, should be offered. This can be done when equipment and instructors can be provided.

4. When the four-term-a-year plan is adopted new plans for the winter and summer schools should be made so that the regular work and short course work may be correlated and duplications avoided.

5. The funds available for all of the short course activities are inadequate. Now that the short courses are considered as regular college instruction it would seem that the cost of maintaining the short courses should be cared for out of regular college funds. A few thousand dollars added to the present apportionment would place these on a sound basis. The money now apportioned from extension funds for short courses could be used to relieve the pressure for more extension work in some departments.

I wish to repeat the recommendation made in the report of last year, that a faculty committee on appointments, to take care of applications coming in for short courses as well as regular college men, be appointed.

W. D. HURD,
Supervisor of Short Courses.

THE DIRECTOR OF THE EXPERIMENT STATION.**I. REVIEW OF THE YEAR.**

There have been comparatively few changes in major positions on the station staff during the year. Dr. Stone's leave of absence was continued until October 1, since which date he has resumed work, devoting himself particularly to the preparation for publication of the results of some of his lines of investigation. In the Veterinary Department Miss Beryl Paige began work on the test for bacillary white diarrhoea in January, while Mr. A. P. Sturtevant entered the department on the first of July to undertake a line of research, of Adams fund grade, on bee diseases.

The lines of work followed in the different departments of the experiment station have in general been the same as those which have engaged their attention during recent years, but during the year investigations have been started in two departments of the college not previously engaged in station work, viz., agricultural economics and microbiology. In the cranberry substation arrangements have been made with the Bureau of Plant Industry of the United States Department of Agriculture for co-operative experiments in the cultivation of the blueberry, and preparatory work has already begun. In the asparagus substation seeds and roots of improved rust-resistant strains of asparagus have been distributed among a large number of growers. This distribution has included 68 lots of roots and 217 packets of seeds. In the Department of Horticulture somewhat less work is being done in plant breeding, as the research work in pomology has made greater demands upon the time of members of the staff. In the Veterinary Department an entirely new line of investigation has been undertaken, viz., the study of the nature and methods of transmission of American fowl brood.

Results obtained.

The heads of all departments report uninterrupted and, in general, satisfactory progress of the investigations under way. A few only of the more significant results obtained will be briefly stated.

Department of Agriculture.—1. In the experiment for comparison of different phosphates it has been noted that the dissolved phosphates greatly stimulate the early growth of the grass—an effect likely to be of great importance on account of the fact that the moisture and other climatic conditions are usually much more favorable to the growth of grass in early spring than later.

2. In the series of experiments comparing different sources of potash difficulty was experienced in obtaining one of the materials which has been under trial. Accordingly, it was thought best to withhold the potash from all. It was noted that the yield on all plots which have been receiving potash annually for a long series of years fell off in very marked degree, in this first season without potash indicating apparently less residual effect than has generally been believed to exist.

3. In the comparison of muriate and sulfate of potash with small fruits the latter, as in recent years, gave a crop about 50 per cent. greater than the former.

4. In the field where different materials furnishing nitrogen are under comparison, both with and without lime, one of the most striking results was the substantial equality of the yields on the limed portion of plots which have received no nitrogen for thirty-one years with the yields obtained on the plots to which nitrogen has been annually applied. Another striking result was the high yield obtained on the unlimed portions of the nitrate of soda plots, indicating the beneficial effect of the residual soda in preventing soil acidity.

5. In the experiments testing the residual effect of application of manure, respectively, in the winter and in spring, a striking result was a more vigorous growth in the early spring on the plots to which the manure in earlier years was applied in spring, and the earlier ripening of the crop—soy beans.

6. Many fields of tobacco in this section failed to produce a satisfactory crop during the past season. A co-operative test with fertilizers on a small scale indicated that the apparent cause of the unsatisfactory growth was shortage of plant food in available form, particularly of nitrogen—a shortage due, no doubt, to the excessive rainfall, for fertilizers in accordance with the usual practice had been used.

Cranberry Substation. — 1. There has been discovered an egg parasite of the fruit worm, which seems to be remarkably effective in reducing the amount of damage from that worm.

2. Knowledge of various injurious insects, their life history and habits has been extended in many directions, with the result that methods of preventing injury are better understood.

3. A preliminary trial indicates that a covering of such shade cloth as is used by tobacco growers may be a useful means of preventing frost damage.

4. Rather serious injury to the roots of the vines has been observed to follow spraying according to methods which have been recommended for preventing fungous diseases.

Asparagus Substation. — The fertilizer experiments indicate —

1. That among growers a larger amount of fertilizer than can be useful to the crop is frequently employed.

2. That nitrate of soda applied, at least in part, at the close of the cutting season gives better results than with all applied in the spring.

3. That phosphoric acid appears to be relatively unimportant, while nitrogen and potash in available forms largely increase the crop, the muriate being the best form of the latter.

Department of Horticulture. — 1. A large amount of data on plant breeding has been accumulated which, in the opinion of Professor Waugh, will serve as a basis for valuable conclusions, if the work can be continued. It has been shown that commercial seed of squashes is very seriously mixed.

2. The work upon the mutual influence of stock and scion has made fairly satisfactory progress. Enough trees have been rooted to set about three-quarters of the 10-acre orchard.

3. A large number of varieties of all our principal fruits are under comparison, and valuable data in regard to these have been obtained.

Department of Chemistry. — 1. The perfection of a new method for determining stearic acid in fats, the use of which shows that butter fat contains from 8 to 22 per cent. of this acid instead of about 2 per cent., as formerly supposed.

2. The perfection of a new method for determining the unsaponifiable matter in fat.

3. Determination of the digestibility of cabbages, carrots, pumpkins, garbage tankage and vegetable ivory meal.

4. Sulfate of ammonia used as a fertilizer removes lime and forms sulfates of iron, alumina and manganese, which seem to act in dilute solutions as plant poisons.

5. The plant-food value of different forms of organic nitrogen in commercial fertilizers has been studied, and experiments show that it varies widely.

Department of Vegetable Physiology and Pathology. — 1. The mosaic disease investigation has been nearly completed, and Mr. Chapman will be ready to report in the near future.

2. The discovery of white pine blister rust in the four western counties has indicated the necessity for investigation of certain phases of the life history of the causal fungus with a view to working out some means of control, as the disease is a very serious one and is already quite widespread in the western part of the State.

3. On account of the abnormally wet summer numerous serious diseases were unusually abundant, and an unusual number of samples of diseased plant tissues have been examined and advice given.

Department of Entomology. — Dr. Fernald reports that one or two of the leading lines of investigation in the Department of Entomology will probably be completed with one more season's work. Satisfactory progress has been made during the past season.

Poultry Department. — 1. A study of the effect of broodiness on egg production shows that it seriously reduces returns. Dr. Goodale estimates the reduction in value of eggs produced amounts to from \$0.80 to \$1 per hen. Some progress has been made in the effort to produce nonbroody strains of the Rhode Island Red, a breed which is ordinarily broody.

2. Much progress has been made in working out a satisfactory method of raising chicks artificially. Dr. Goodale reports that faster growth and larger chicks were secured than ever before, and that the results were all that could be hoped for.

Veterinary Department. — 1. The principal emphasis has been laid upon methods of diagnosing fowls which harbor white

diarrhœa. The agglutination test has been brought to a higher degree of perfection.

2. An effort to eradicate white diarrhœa from the flocks of the State, through work in co-operation with the Extension Service, has been begun.

Department of Microbiology. — Dr. Marshall reports that the investigational work naturally falls into two divisions — dairy microbiology and soil microbiology. The department is also engaged in investigations under the De Laval graduate assistant fund. The department has also devoted considerable time to microbial analytical work in milk, preparation of legume cultures and dairy cultures, and the determination of organisms in human diseases (the latter for the town of Amherst). The work in soil microbiology will be somewhat impeded, through lack of suitable laboratory accommodations, until the completion of the new building. In other directions the work of the department has made satisfactory progress.

The Department of Agricultural Economics. — Investigations in this department connected with the work of the experiment station have been directed along two principal lines: —

1. Methods of onion storage and distribution.
2. Investigation of the cost of producing milk on typical Massachusetts farms.

Satisfactory progress in both lines of investigation has been made, and Dr. Cance reports that the onion investigation is being rounded into final form.

II. IMMEDIATE PRESSING NEEDS.

The different heads of departments, in response to my invitation that they indicate any immediate pressing needs in their several departments, have called attention to a considerable number of things which are highly desirable, indeed necessary, to a thoroughly satisfactory prosecution of our work. Without expressing my own opinion as to the relative necessity for the different things named by department heads, I will quote briefly from each: —

Professor Waugh: Two important needs should be emphasized — first, the work in plant breeding now being laid off by Dr. Shaw should be taken up by a well-trained plant breeder

and carried to practical conclusions; second, experiment work in market gardening should be speedily established.

Dr. Lindsey: The department has no pressing needs. It does, however, need improved facilities for conducting feeding experiments, and is likely to need more laboratory facilities and assistants if the work continues to increase. He needs an assistant in animal nutrition.

Professor Osmun: The unexpected discovery of the white pine blister rust over a large territory presses home more strongly the need of some sort of plant disease survey work. Reorganization of the department staff, assigning to each member specific duties and field of investigation is needed.

Dr. Fernald emphasizes strongly the need for experiments in spraying a plantation of about twenty different kinds of trees, including fruit, small fruit, shade trees and forest trees, to be the property of the department and to be used for experimental purposes by this department only. He also calls attention to the need of an addition to the entomological staff for experimental work.

Professor Graham calls attention to the necessity for more land.

Dr. Paige states that the most pressing need is for additional help to carry on the white diarrhoea work.

Almost every department calls attention to the fact that more money is either necessary or can at any rate be used to great advantage. In the Agricultural Department we shall need a new vegetation house in the near future, and the work in connection with the Tillson Farm will necessitate some addition to our outdoor workers.

An analysis of the situation indicates to my mind that we must in the near future plan to enlarge our staff. In the Agricultural Department we need to do more work in connection with tobacco and onions, and we may need a tobacco specialist. Another man can be used to great advantage in entomology. We certainly need more assistance to carry on the white diarrhoea work. If the market gardeners secure an appropriation we shall need one or more men for investigation in that line of work; and if the seed law passes, we must have a seed specialist.

The recent discovery that white pine blister rust, the most serious disease affecting any of our forest trees, has gained an extensive foothold in the four western counties indicates the desirability of intensive work in the Department of Plant Physiology and Pathology on this disease. This can perhaps for the present be managed without additional assistance, but developments may be such that we shall greatly need to employ the services of a pathologist.

While the acquisition of the Tillson Farm will for the time being meet some of the more pressing needs for more land, it will not satisfy our requirements for any great length of time. Indeed, the Poultry Department now greatly needs land for extension on the experimental side, and the acquisition of land lying nearer the poultry center than the Tillson Farm is greatly to be desired in the very near future.

W. P. BROOKS,

Director.

THE DIRECTOR OF THE EXTENSION SERVICE.

GENERAL ADMINISTRATION.

The work of the Extension Service has proceeded along much the same lines during the past year as in 1914. Little attempt has been made to organize new lines of work, the greater effort being put on the better organization of lines already under way, the systematizing of records, reports, etc., and the attempt to better correlate the extension work of the college with the teaching and research sections.

It has been gratifying to know that the type of organization which has been worked out at this college has fully met the requirements laid down by committees representing the Federal and State agencies, and has been used as a model by several States which have lately taken up the definite organization of extension work.

The first year's work under the Smith-Lever appropriation has been carried on satisfactorily to those in Washington who have supervision of the work. The accounts have been audited, and all expenditures without exception have been approved. These funds are being used at present for full or partial support of projects dealing with fruit growing, animal husbandry, boys' and girls' club work, poultry husbandry, farm management demonstrations, home economics, dairying, extension schools, county and district agricultural agents and printing. The additional amount available from these funds during the year July 1, 1915, to June 30, 1916, is \$2,930.75.

During the past year all the extension work of the institution has been placed on a definite written project basis. Each project has had the approval of heads of departments, directors, the president of the college, and the Washington authorities. The co-operative relationships with the United States Department of Agriculture established in 1914 have been maintained to our own and, I believe, the general satisfaction of the States Relations Service at Washington.

Besides the co-operative work in agriculture and home economics under the Smith-Lever act, the United States Department of Agriculture is helping us to maintain, with their appropriation for demonstrations outside the cotton belt, the fol-

lowing lines: boys' and girls' clubs, farm management demonstrations, and assistant State leader and farm bureau work. Every effort has been made to maintain cordial co-operative relationships with all other official and voluntary organizations within the Commonwealth in work of mutual interest. During the year arrangements have been made for furnishing clerical help to several departments, and members of the teaching faculty in agricultural education, pomology, agricultural economics, landscape gardening, farm management and beekeeping are now being paid from extension funds for the proportion of their time which is given to extension work.

During the month of August, in answer to urgent calls from the superintendents of various State institutions for help on their agricultural problems, eight members of the faculty visited seventeen of these institutions on a tour of inspection and advice. The work of each was gone over, plans were discussed, and a written report approved by all members of the party has been submitted to each. This is the initial step in what promises to be helpful co-operative work between the college and the other institutions supported by State funds.

In January, 1915, a biennial report of the Extension Service covering 40 pages was published.

During the past year the Extension Service has suffered from the loss of several of the most efficient members of the staff. Those who have left us have all accepted positions of trust and responsibility, and it is gratifying to know that we have had as members of our staff persons who are sought by other States and colleges to become heads of some of their most important departments.

Work carried on by State Funds alone.

Correspondence Courses and Publicity. — The work in the correspondence courses has been carried on along lines similar to the past year. The courses in floriculture, pedagogy of agriculture, gardening and elementary agriculture have been dropped. Courses in human nutrition, apple growing and small-fruit culture have been added. Some other courses, due to inability of the faculty to carry them, have been temporarily discontinued.

The supervisor of these courses recommends that members of the faculty be paid for preparing lessons and correcting the questions as they are returned. Graduate students or capable seniors might be engaged for this latter work. Before the correspondence courses can be developed as they should be it will be necessary to provide more funds to be used in preparing the courses, correcting papers, in the employment of additional clerical help, and for supplies and maintenance. The group study idea is being adopted in several places, and promises to be very successful. It is hoped that some co-operative arrangements can be made with the Correspondence Course Department of the State Board of Education created by the last Legislature, in order that our work may be enlarged and organized on a more satisfactory basis.

Civic Improvement. — The work in civic improvement during the past year has been largely in service rendered to small towns, school boards and individuals. There is a distinct and growing demand for this work. Work has been carried on in connection with 33 projects in 25 towns. Fifty-two plans have been prepared. Ten reports have been rendered. Six separate pieces of work have been supervised. Twenty-nine consultations have been held and 32 lectures have been given.

The civic improvement work has been made a part of the work in extension schools, exhibits and demonstrations. The problems to be taken up during the coming year are related to school ground improvement and playgrounds (urgently needed in small towns and rural communities). The obtaining of public reservations for recreational purposes is also important.

The preparation of farmhouse plans has aroused interest, and should be followed up by further and more extensive studies of plans for other buildings and for the laying out of the farmstead. Surveys should be made to furnish a basis for rural planning work.

The position of extension instructor in civic improvement has not as yet been filled, which handicaps the development of the work.

M. A. C. Agricultural Improvement Association. — No constructive work was carried out by this association during the year. The canceling of farmers' week at the college did not

give opportunity for the regular annual meeting at that time. The demand for choice strains of corn and potatoes was so great that members had no difficulty in disposing of the supply on hand. The season of 1914 was decidedly unfavorable for the production of choice seed, which accounted for the small supply. An effort will be made to revive interest in this association, to the end that it may serve the interests of the State in the manner originally intended.

Community Planning. — During the past year the work of community planning has emerged from the experimental stage as to methods of procedure, and has settled down to the adoption of well-planned long-term policies in several communities. Extension schools of community planning were held in Littleton, Bolton, Framingham and Hubbardston. County conferences were held in Essex, Barnstable and Hampshire counties. Work in community planning has been made a part of the co-operative work carried on with the State Board of Education through the vocational instructors during this year. The instructors in New Salem, Leominster, Reading, Brimfield, Clinton, Sutton, Ashfield, Harwich, Petersham and Hadley have taken up this work.

Assistance in community organization, studying the needs of counties, etc., has been rendered to county agents in Hampshire, Franklin, Plymouth, Norfolk, Barnstable and Worcester counties. Follow-up work (in communities already entering into long-term policy planning) has been carried on in Bolton, Hubbardston, Tyringham, Wilbraham, Brimfield, Montague, Sterling, Charlton, Billerica, Shutesbury, Lanesborough, Chartley, Berlin and Littleton. New communities taking up the work for the first time are South Athol, North Dana, North Leominster, Chester, Sutton, Harwich, Westminster, Petersham and Framingham. Mr. Morgan has continued to act as secretary of the Massachusetts Federation for Rural Progress during the year, and was selected as a special agent of the Massachusetts Development Committee.

If Mr. Morgan is to continue as secretary of the Federation, and if a considerable amount of work is brought into this office as a result of his connection with the Massachusetts Development Committee, more clerical help must be provided. Office

facilities are now unsatisfactory, but this may be remedied when Room G becomes available. If this work is to be conducted with the thoroughness which it demands, and if follow-up work is to be practiced in the way that it should be, either another man must be provided or else the work as now laid out must be curtailed.

Library Extension Work. — During the year the practice of loaning traveling libraries to small towns has been developed more than in past years. Five hundred and seventy-two books and 106 bulletins have been loaned to 33 libraries. A large number of letters have been written to library officers in regard to the purchase and use of books on agriculture and related topics. Five library leaflets on agricultural books have been published and distributed. This phase of our extension work is well defined, and the librarian should receive more financial and clerical assistance in order that the work may be enlarged and extended.

Lectures and Lecture Courses. — The supervision of this work was transferred from Mr. Forbush to Professor Waid, March 1, 1915. An attempt has been made to systematize the lecture work of the institution, keeping more careful records of the lectures given by members of the regular faculty doing extension work. Monthly reports are now secured and a card index by towns is being arranged.

Many lectures and lecture courses are now arranged through county agents, and it is hoped that proper co-operative relationships with the farm bureaus will exist so that the largest possible amount of good may be rendered in different sections of the State. An attempt is being made to give fewer single lectures and to have courses or series arranged wherever possible. The giving of a course of 45 lectures, under the auspices of the Boston Chamber of Commerce, to more than 900 people was a notable feature of the work. In all, there were approximately 900 lectures given by members of the faculty during the past year to approximately 66,000 people. Moving-picture apparatus and films should be made a part of our lecture equipment, and a change in the State law should be secured so that the college can use certain types of apparatus without complying with such stringent laws.

Exhibits. — The exhibits in connection with agricultural fairs, and special exhibits, were more systematic and effective than in past years. The general exhibit is now arranged in quite complete separate units, so that these may be used at fruit, dairy, poultry shows or other exhibitions. This year the exhibits were transported from fair to fair by auto truck, thus economizing time and expense. The exhibit was in attendance at the following fairs: Barnstable, Worcester, Clinton, Willimansett, Uxbridge, Framingham, Great Barrington, Northampton and Ware. The period covered was from August 25 to October 9.

The usual number of lectures and demonstrations were carried on in connection with these exhibits. The present exhibit is a good one, but the need seems to be to incorporate more life by means of animals or mechanical contrivances.

Work carried on by State, Smith-Lever and United States Co-operative Demonstration Funds.

Fruit Growing. — The demonstration orchards which were first planted six years ago have been frequently visited, demonstrations have been given, and those who live in the vicinity, as well as the owners of these orchards, have been instructed in the best methods of caring for orchards. A growing interest in these orchards is manifested in communities where they are located.

One new orchard has been established on the farm of Henry L. Green of Paxton. The exhibit material has been enlarged, and the specialist was present for consultation at nine fairs, giving talks and demonstrations. The pomological teaching in the extension schools has been in most cases increased from a half to a full week's work. A pruning and spraying campaign was organized in Shelburne in co-operation with the Franklin County Farm Bureau. This was successful, but could not be carried to other counties on account of lack of time and sufficient force to handle the work. Work in co-operation with the State Board of Agriculture, in connection with the new apple grading and packing law, was carried on. Mr. Rees gave thirty-seven single lectures and demonstrations before

various organizations, judged at several fairs, and frequently made farm visits.

Those in charge of this work believe it to be established along right lines, but unless another man can be added to the force it is inadvisable to develop new work the coming year.

The farm bureaus make increased demands for assistance, and during a few weeks in the spring it is not possible to get to all the demonstration orchards for pruning or spraying at the proper time. It is evident that another man is badly needed to help develop work which ought to be carried on in this State.

Publications and Publicity. — Under the Smith-Lever act \$500 was allowed for printing and publication. This was supplemented by an apportionment of \$900 from State funds, making a total apportionment of \$1,400.

Fifty publications, varying from 1 to 40 pages, in editions making a total of 204,200 copies, were printed during the year. In addition to this there were several thousand application blanks, schedules, announcements, posters, etc., issued.

The following is a list of the principal publications for the year: —

12 Facts for Farmers.

9 Primers of Instruction and 1 Account Book for Boys' and Girls' Club Work.

5 Library Leaflets.

3 Massachusetts Bulletin for Farm Women.

4 Market Gardeners' Journal.

2 Cow Record Books.

1 Report of the Extension Service.

1 Extension Bulletin.

Mr. Forbush has regularly sent news letters of approximately 1,200 words each to the daily, weekly and agricultural papers of the State. Fifteen special news letters have been prepared and sent to selected publications. The lectures of the summer school and conference have been abstracted and furnished to the press.

Reliable publications seek material concerning our extension activities. It is to be regretted that the staff is not sufficient to furnish this when it is asked for. This sort of publicity work reaches the people with timely agricultural information, and

the college owes it to those who support it to keep them informed as to the opportunities and advantages offered to them.

Animal Husbandry. — The resignation during the year of both the head of the Animal Husbandry Department and the extension specialist makes it difficult to report very specifically, as no report was left by either of the extension work done. The work has continued along the same lines as last year, including dairy improvement association work, extension schools, fair exhibits, milk shows, boys' judging contests, correspondence course work and lectures before granges, breeders' associations and so forth. A special effort has been made to keep in touch with the county agent work, and numerous conferences, farm visits and other advisory work have been done with the county agents and county schools throughout the State.

Boys' and Girls' Club Work. — The general interest in boys' and girls' clubs and junior extension work has continued to grow, and no doubt these activities will have the greatest effect on the future of Massachusetts agriculture of any of the extension work that is being carried on. The potato and corn club work this year has not been so successful as in 1914, while the market garden, poultry and home economics clubs have been better. Canning and pig club work were started this year for the first time, and have proven very satisfactory. This year 69,281 members have been enrolled, as against 42,467 last year. Clubs have been organized in 315 towns, as compared with 269 in 1914.

Mr. E. N. Boland took up his duties as agent in charge of pig club work, Aug. 14, 1915. Between this date and October 10, 211 club members were visited, the object being to teach the scoring of pigs and to help on questions of feeding, care and general management. The interest of boys and girls in this work has always been good, and the parents give much assistance. Boys and girls in the vicinity of Brockton were aided in the securing of pigs by loans of money from the Plymouth County Trust Company of that city. In this way 173 pigs were furnished to those who could not otherwise have had them. Notes were taken from the boys and girls, to be paid with interest at the close of the contest.

The canning and home economics clubs under Miss Nash's

direction have been exceptionally well carried on. The third prize winners in State contests were brought to the college for a week in the boys' and girls' camps, the latter being held in 1915 for the first time.

This work needs more support and assistance than we are able to give at the present time. With the present force practically no follow-up work is possible. There should be at least one office assistant, who understands club literature and office management and administration, in addition to the clerical help now provided. There should also be a poultry club man and a general assistant for the field work.

Farm Management Demonstrations. — The farm management demonstration work was carried on under the direction of B. W. Ellis until Feb. 1, 1915, when it was taken over by W. H. Bronson. The work has consisted chiefly in taking farm records, tabulating these and preparing factor sheets, returning these factor sheets in person to the owners of the farms, and following up the suggestions made by visits during the summer; also by fair exhibit work and lectures before various organizations. Areas have been taken for this work in 16 towns in 7 counties. In all, about 800 records have been taken and tabulated, and nearly 500 have been returned to the farmers.

Between February 1 and July 1 Raymond L. Whitney secured 189 records on the onion and tobacco farms of the Connecticut valley. Mr. Bronson has been assisted in this work by four county agents and five agricultural schools. It is planned to survey new areas in 1916, as well as to retake all those which have been surveyed during the past three years. A small circular giving results of this year's work is to be issued. Calls are frequent for a good system of farm-accounting blanks. These should be issued and sold at a nominal price. It is hoped that in a short time a large number of farmers will be able to analyze their own business.

This farm management demonstration work, in our judgment, is the best method we have as yet attempted to use in our efforts to get farmers to reorganize their farm business and place the same on a profitable basis.

Poultry Husbandry. — Practically all the lines of extension work, such as lectures, demonstrations before granges and agri-

cultural societies, agricultural fairs, exhibits and demonstrations, extension schools, conferences, the poultry convention, etc., which were started previous to this year, have been carried on in the usual way. Having taken on a man especially for demonstrational work, we have emphasized two new lines, namely, the testing of hens for bacillary white diarrhoea and the co-operation of local poultry organizations in the way of exhibits. Mr. Alfred G. Lunn took up his duties as extension instructor in poultry husbandry on July 20, 1915.

Home Economics. — The new lines of work started during this year have been the beginning and completion of a three months' project for home management demonstration in the town of Brimfield under the direction of Mrs. Horatio Dresser; the preparation, sending out and return of a questionnaire to follow up the instruction given in extension schools; organization of a correspondence course of ten lessons on foods; the issuing of three "Farm Women" bulletins; the visiting of rural schools which teach home economics or prepare noonday lunches; and the arranging of an extension program to be carried out by the American Home Economics Association. Of the work which had been previously organized, three lines have been strengthened, namely, extension schools, canning demonstrations and boys' and girls' home economics clubs.

The two most urgent needs are: —

1. That a room should be provided on the campus to be used as a kitchen laboratory and general experimental room, in order to test out apparatus, etc., which is to be used in the work.

2. A third person should be employed in order that more extension schools of homemaking may be held; that study groups may be organized in localities where extension schools have been held; that conferences may be had with correspondence study groups; that more home economics club meetings may be attended; that more of the calls for lectures and demonstrations may be met; and that more attention may be given to correspondence courses.

The work of Mrs. Dresser in Brimfield has demonstrated the fact that, provided the right sort of a woman can be secured, it is possible to secure just as good results from home manage-

ment demonstrations as it is to secure results from farm management demonstrations.

During the year Miss Harriet Hopkins resigned as assistant in the work, and Miss Marie Sayles has been elected to fill her place.

Dairying. — The extension work of the Dairy Department during the past year has consisted principally of the following: —

The organizing of two milk shows — one at Worcester (the largest to date in this country), and the one held annually at Amherst in connection with farmers' week. We co-operated with the Fitchburg milk inspector in an exhibit at the local fair, judged and scored the milk, and sent a representative to answer questions. The dairy section of the fair exhibit was enlarged. A representative of the department made the State institution trip in company with other members of the faculty, and as a result is helping with dairy barn plans at the Massachusetts General Hospital at Waverley. A representative of the department is working on plans, equipment, etc., for a co-operative creamery at Blandford. The Extension Service specialist is secretary of the Massachusetts Creamery Association and the Massachusetts Dairymen's Association. Lectures have been given, slides have been furnished for the use of milk inspectors, five dairy barns have been remodeled under our advice, correspondence courses have been conducted, and assistance has been given in securing dairy legislation. There is need of developing the work more than in the past. Lantern slides or moving-picture films should be prepared. There is call for more work than can be done at present in the fairs and expositions of the State.

Extension Schools. — Ten extension schools in agriculture were held during the year. The attendance was uniformly good and the interest was all that could be asked. It has been necessary to employ during the past year persons outside the regular staff for some work. This evidently detracts from the efficiency of the teaching.

Four extension schools of community planning were held, and it is felt that there will be fine results from these. This work was made more definite this year by the preparation be-

forehand of syllabi of all talks to be given. The teaching staff of the college co-operated finely in these schools, and it was only through their interest and work that this type of school was made possible.

We very much desire to inaugurate some effective follow-up work to be carried on in all communities where extension schools of either type have been held.

Demonstration Auto Truck. — Demonstration work, using the auto truck as a means of carrying equipment and demonstrator, was continued until Feb. 1, 1915. The growth of county agent work during the year made it unnecessary to continue the work after the resignation of Mr. A. F. MacDougall, who was in charge. The work consisted in visiting towns, calling farmers together in groups and demonstrating proper methods of pruning and spraying fruit trees, packing fruit, operation of dairy machinery, laying out fertilizer demonstration plots, and inducing farmers to keep dairy records and better farm management records.

After February 1, on approval of the Washington authorities, the money which was being spent on this project was placed on the other projects listed in this report.

Extension Work through County and Local Agents. — This includes the report of Mr. B. W. Ellis as assistant State leader.

The farm bureau and county agent work has made remarkable growth during the past year. Prior to Dec. 1, 1914, only one county (Hampden) was organized to the extent of having county agents engaged. During the year Worcester County has organized, with Charles H. White as manager with three assistants; Hampshire County, with A. F. MacDougall as agent; Plymouth County, with Bertram Tupper as agent; Norfolk County, with W. A. Munson as agent; and Franklin County, with John D. Willard as general secretary and Sumner R. Parker as agent. The activities of the Faunce Farm at Sandwich have been broadened so that L. B. Boston, superintendent, acts as county agent for Barnstable County. R. H. Gaskill has been appointed county agent for Bristol County, with headquarters at the County Agricultural School, and H. F. Thompson is acting as district agent in the market-garden district surrounding Boston. F. A. Castle has been

acting as district agent for boys' and girls' club work for a group of towns with Framingham as a center. The Hampden County Improvement League now has five paid agents besides its clerical staff.

Berkshire County is nearly ready to call for a man. Probably Essex County will engage a man to act as county agent with headquarters at the County Agricultural School. Middlesex County held one meeting, but decided not to go further with the movement. Seventy-two per cent. of the land area of the State is now under the jurisdiction of farm bureaus and county agents. Co-operative relationships under the general memorandum of understanding with all these county and district organizations have been entered into, and in the main are proving satisfactory excepting in Worcester County. The work in five counties has been placed on a written project basis, with signed projects filed in the extension office.

The State leader or assistant State leader regularly attends the monthly meetings of the county or district organizations. The sum of \$1,200, State and Federal funds, is being paid to each county or district organization with which we are co-operating. This amount equals that being contributed from these sources in any other State. Co-operative relationships are also maintained with the State Board of Education through county and local agricultural high schools. This has seemed to be a most satisfactory arrangement, and these local agents have assisted much in the carrying on of farm management demonstration work and in several other lines. Two county schools, one independent school (Smith's), and thirteen teachers of agriculture have worked with us under this arrangement during the past year. The present county agent law is a poor one and should be amended at an early date.

We need to establish at the present time a fair and well-defined working basis between the Extension Service of the college and the United States Department of Agriculture on the one hand, and the county and district organizations on the other. There is a disposition on the part of individuals in some county organizations to accept financial aid, but to deny the privilege of joint supervision of work to be done and expenditure of funds, thus practically blocking any real co-operation.

We believe that the county and district agents should be local representatives of the college and the United States Department of Agriculture; that we should work with and through these agents; and that there should be joint approval by the college and local governing boards of work to be done and of the persons who are to carry on the work after this has once been decided. Only by such a working plan can harmony and efficiency be secured and the whole extension work movement organized on a State and nation wide basis.

Mr. B. W. Ellis resigns as assistant State leader, to take effect Dec. 31, 1915. Mr. Sumner R. Parker has been engaged for this position, his duties to begin Dec. 6, 1915.

Co-operation and Marketing. — This work, carried on under the direction of the Department of Agricultural Economics, has consisted mainly of six types: —

1. General lectures and conferences on markets, co-operation and rural organization.

2. Conferences for the organization of farmers' exchanges.

3. Work with the Massachusetts Development Committee, Bureau of Labor and Unemployment and other organizations.

4. Lectures to granges, farmers' clubs and other organizations.

5. Advice to co-operative exchanges as to organization, general management, etc.

6. Rural credit studies and the giving of information concerning these.

In addition to the foregoing there have been many conferences with market men, railroad officials, county agents and farm bureaus, consumers and producers.

Seven new co-operative exchanges were organized during the past year.

Up to July 1 Mr. Ferguson was employed on half time by the Office of Markets, Washington, D. C., for an investigation of the distribution of milk in Massachusetts. Studies were made in Amherst, Haverhill, Northampton, Pittsfield, Worcester and Springfield. He also rendered valuable assistance to the Boston Chamber of Commerce in the series of meetings which they held in different parts of New England, and in the preparation of the report which is now being circulated. The

organization of seventeen co-operative exchanges since the employment of an extension specialist is a significant fact. These in the beginning met with pretty strong opposition on the part of farmers themselves.

The credit plan evolved by Mr. Ferguson met with the approval of the bankers of Hampden County, farmers and the United States Department of Agriculture. There is need of doing definite research work in marketing lines especially, and some arrangements should be made during the coming year with the experiment station, so that the Extension Service specialist in this subject may spend part time in gathering information and the remainder in the organizing of buying and selling societies.

Work carried on alone by the United States Department of Agriculture Co-operative Demonstration Funds.

Hog Cholera. — Dr. D. I. Skidmore, who was assigned by the Bureau of Animal Industry, United States Department of Agriculture, for demonstration work in the prevention of hog cholera, was withdrawn from the State at the time of the outbreak of the foot and mouth disease to help in eradicating this. The unforeseen expense of this work has made it impossible for the Department to reassign him to us to continue this work, so that little has been done on the project during the year.

Temporary Projects, not in Force after July 1, 1915, carried on by State, Smith-Lever and the United States Department of Agriculture Co-operative Demonstration Funds co-operatively.

Gardner Boyd was engaged as temporary assistant in club work, Raymond Whitney for farm management demonstrations, Mrs. Horatio Dresser for home management demonstrations, F. A. Castle for club work in the district surrounding Framingham, H. F. Tompson for market-garden demonstrations, and three senior students as demonstrators to assist county agents in the crowded season of work. This work was financed from unexpended balances of Smith-Lever money and from funds

assigned by the Office of Extension Work at Washington. The projects were all discontinued July 1, 1915. Reports of the work which was carried on will be found under the proper departments in this report.

RECOMMENDATIONS.

There are many recommendations which might be made by the director, few of which can be carried out with no more State funds at hand than we had three years ago.

It is a discouraging proposition to have two or three times as many calls for help coming in from earnest people as can be cared for. The members of the faculty of the college are anxious to do more extension work, but funds for this cannot be provided.

The present fixed appropriation is still to run three full years. Before the end of that period the trustees must face the problem of curtailing or abolishing some lines now in force, or providing some financial relief. It is clear that the Extension Service will suffer badly if we cannot increase salaries sufficiently to keep tried and proven members of our staff with us. The advent of farm bureau work makes it necessary for us to engage a few highly trained specialists rather than a large number of inexperienced demonstrators. In this way we can give county agents the assistance in special lines which they so much need.

We must certainly hold strictly to a program of concentration rather than expansion.

I would recommend that a change of law be secured so that a report of the Extension Service may be printed at State expense, in the same way as the station report is now handled.

A full report of statistics and a financial statement will be rendered as a part of a more complete annual report as now required by the Smith-Lever law as soon after the 1st of December as these figures can be secured.

So far as the need of more persons to do extension work is concerned, I can do no better than to reiterate what was said in the biennial report published some months ago, slightly modified. This is as follows:—

1. With an appropriation already fixed for the next three years by the State, and the fact that, due to the reasons already stated, Massachusetts receives but \$2,440 additional each year from Smith-Lever bill funds, no enlargement or expansion of extension activities can be expected. The most that we should try to do is to retain if possible our present excellent force of extension workers, and to perfect within the institution itself a better working organization.

2. There is an urgent need for the adoption by the trustees of a definite policy defining what the extension work of the institution should be, and the relation of all employees of the college to it. The director suggests that the following definition might be used on which to base the policy: "The Extension Service is the whole institution (every department and individual) at work doing what it can to upbuild the rural life of the Commonwealth, and all employees are expected, in so far as extension work does not interfere with their teaching or research work, to take their part in this movement, and to make themselves and their departments as useful as is possible in the different movements to build up the agricultural industry of the State."

3. While there is probably no chance of our meeting any of the immediate needs for more help, yet these should nevertheless be presented. There are organizations such as the poultrymen, those interested in boys' and girls' club work, and the market gardeners, who are willing to go before the Legislature and secure funds to carry on the work which they wish done. It would seem that under such circumstances no objection should be raised by the college.

So far as demands for help and assistance are concerned, plans might be made to expend profitably at least \$50,000 in addition to what is now being appropriated. Existing conditions, however, must be considered, and only the most urgent needs are here mentioned.

(a) Extension instructor in market gardening:—

Salary,	\$2,000 00
Travel,	500 00
Supplies and equipment,	200 00
	<hr/>
	\$2,700 00

(b) Extension worker in poultry husbandry:—

Salary,	\$1,800 00	
Travel,	500 00	
Supplies and equipment,	200 00	
	<hr/>	\$2,500 00

(c) Extension workers, boys' and girls' clubs
(United States Department of Agriculture
might pay one-half salary and expenses):—

Salaries of supervisors (4),	\$5,400 00	
Travel (4),	2,000 00	
Supplies and equipment,	600 00	
	<hr/>	8,000 00

(d) Extension instructor in agronomy:—

Salary instructor,	\$1,800 00	
Travel,	500 00	
Supplies and equipment,	200 00	
	<hr/>	2,500 00

(e) Extension instructor in fruit growing:—

Salary instructor,	\$1,500 00	
Travel,	500 00	
Equipment,	100 00	
	<hr/>	2,100 00

(f) Extension worker in farm management dem-
onstrations (United States Department of
Agriculture might pay one-half salary and
expenses):—

Salary,	\$1,500 00	
Travel,	700 00	
Equipment,	100 00	
	<hr/>	2,300 00

(g) Extension instructor in home economics:—

Salary,	\$1,200 00	
Travel,	500 00	
Equipment,	100 00	
	<hr/>	1,800 00

(h) Adviser and demonstrator to work with State
institutions:—

Salary,	\$3,000 00	
Travel,	700 00	
	<hr/>	3,700 00

(i) Extension instructor, injurious insects and
plant diseases:—

Salary,	\$1,800 00	
Travel,	500 00	
Equipment,	200 00	
	<hr/>	2,500 00

- (j) Extension instructor in agricultural engineering:—

Salary,	\$2,000 00
Travel,	500 00
Equipment,	200 00
	<hr/>
	\$2,700 00

- (k) Extension assistant in beekeeping (part time), . . . 1,200 00

- (l) Clerical assistance and office equipment required for above additional force, 6,000 00

Total,	<hr/>	\$38,000 00
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4. Since the college receives for instructional purposes an automatic increase in its funds, the cost of running the short courses (approximately \$8,500) might be paid from these funds, thus relieving the extension budget to that extent. Some of this much needed work might then be started.

The director has every reason to commend in the highest terms all members of the Extension Service staff and those members of the college faculty and station staff who continue to offer such fine co-operation in the attempt to make this college a "public service institution." They render an unselfish service which cannot be fairly reckoned on a financial basis.

WM. D. HURD,
Director.

TABLES AND STATISTICS.

TABLE I. — *New Appointments.**A. In the Academic Departments.*

POSITION.	Name.	Institution from which graduated and Degrees.
Instructor in botany, ¹	Paul J. Anderson, .	A.B., Wabash College, 1910; Ph.D., Cornell University, 1914.
Professor of military science, . .	Henry W. Fleet, .	Culver Military Academy.
Assistant in microbiology, ¹ . . .	Arao Itano, .	Michigan Agricultural Col- lege, B.Sc., 1911.
Assistant professor of dairying, ¹ . .	Orville A. Jamison, .	Ohio State University, B.Sc., 1912.
Assistant professor of agronomy, . .	Earl Jones, .	Ohio State University, B.Sc., 1912; M.Sc., 1913.
Professor of animal husbandry, ² . .	John C. McNutt, .	Ohio State University, B.Sc., Agr., 1907.
Assistant in agronomy, ¹	Frederick G. Merkle, .	Massachusetts Agricultural College, B.Sc., 1914.
Instructor in farm management, ¹ . .	Walter M. Peacock, .	Cornell University, B.Sc., 1913; M.Sc., 1915.
Professor of rural sociology, . . .	John Phelan, .	University of Michigan, A.B., 1910; A.M., 1912.
Assistant in agricultural economics, ^{1, 2}	Frederick W. Read, .	Massachusetts Agricultural College, B.Sc., 1914.
Assistant in chemistry,	Paul Serex, Jr., .	Massachusetts Agricultural College, B.Sc., 1913.
Assistant to the commandant, ¹ . . .	Alexander Smart, .	- - -
Assistant professor of horticulture, ¹ . .	Charles H. Thompson, .	Kansas State Agricultural College, B.Sc., 1893; M.Sc., 1898.
Assistant in physics, ¹	Harry C. Thompson, .	Worcester Polytechnic Insti- tute, B.Sc., 1915.
Assistant professor of market garden- ing, ¹	Andrew S. Thomson, .	Brown University, Ph.B., 1898; Columbia University, A.M., 1912.
Professor of market gardening, . . .	Harold F. Tompson, .	Massachusetts Agricultural College, B.Sc., 1905.
Instructor in animal husbandry, ⁴ . .	Glenn J. Wight, .	Cornell University, B.Sc., 1914.

B. In the Experiment Station.

Assistant chemist, ⁵	Norman H. Borden, .	Rhode Island State College, B.Sc., 1915.
Assistant,	Robert L. Coffin, .	Coburn Classical Institute, 1907.
Assistant in veterinary science, ¹ . .	Beryl H. Paige, .	Mount Holyoke College, A.B., 1911.
Assistant in veterinary science, ¹ . .	Arnold P. Sturtevant, .	Clark College, A.B., 1912.

¹ New position.² Services to begin Jan. 1, 1916.³ Services to begin Feb. 1, 1916.⁴ Temporary engagement.⁵ Temporary appointment during leave of absence of Mr. R. W. Ruprecht.

C. In the Extension Service.

POSITION.	Name.	Institution from which graduated and Degrees.
Extension instructor in charge of boys' and girls' pig club work. ¹	Eric N. Boland,	Massachusetts Agricultural College, B.Sc., 1912; Iowa State College, M.Sc., 1913.
Instructor in farm management demonstrations.	Wesley H. Bronson,	Cornell University, B.Sc., 1913.
Extension instructor in poultry husbandry. ¹	Alfred G. Lunn,	Oregon Agricultural College, B.Sc.Agr., 1912.
Assistant State leader,	Sumner R. Parker,	Massachusetts Agricultural College, B.Sc., 1904.
Extension instructor in home economics,	Marie Sayles,	Kalamazoo Normal School; Columbia University, Teachers' College, B.Sc., 1914.
Extension instructor in animal husbandry. ²	William F. Turner,	Kansas State Agricultural College, B.Sc., Agr., 1910.

¹ New position.² Services to begin December, 1915.*D. In the Clerical Staff.*

POSITION.	Name.
Clerk, treasurer's office,	Eleanor F. Bishop.
Cashier, treasurer's office,	John K. Broadfoot.
Clerk, president's office,	Bertha A. Brockhaus.
Assistant in library,	Anne Butler.
Stenographer, Department of Agricultural Education,	Phyllis J. Cogswell.
Clerk, Department of Poultry Husbandry,	Marcella C. Curry.
Telephone operator, Stockbridge Hall, ¹	Louise G. Davidson.
Clerk, director's office, experiment station,	F. Ethel Felton.
Clerk, Extension Service, ¹	Lillian S. Hadfield.
Clerk, Department of Rural Sociology, ^{1, 2}	Mary E. Horton.
Stenographer, Extension Service,	Helena Keiber.
Stenographer, treasurer's office,	Irene A. Martin.
Clerk, dean's office,	Mary I. Shores.

E. Miscellaneous.

Assistant engineer,	Thomas F. Butterworth.
Resident nurse, ¹	Florence Levensaler.

¹ New position.² Transferred from president's office.

TABLE II. — *Resignations.*

POSITION.	NAME.
Assistant in library,	Clarissa G. Babcock.
Extension instructor in farm management and assistant State leader,	Herbert J. Baker.
Instructor in chemistry,	Robert H. Bogue.
Assistant in library,	Anne Butler.
Cashier, treasurer's office,	Mary E. Caldwell.
Assistant to the dean,	Bertha E. Christiansen.
Stenographer, Department of Agricultural Education,	Marion S. Donaldson.
Assistant State leader, ¹	Benjamin W. Ellis.
Extension instructor in civic improvement,	Philip H. Elwood, Jr.
Assistant chemist, experiment station,	Walter S. Frost.
Extension instructor in home economics,	Harriet J. Hopkins.
Assistant professor of agronomy,	Elmer M. McDonald.
Extension instructor in charge of demonstration auto truck, . .	Allister F. McDougall.
Associate professor of animal husbandry,	John A. McLean.
Professor of military science and tactics, ²	George C. Martin.
Clerk, Department of Poultry Husbandry,	Fay L. Milton.
Stenographer, Extension Service,	Ina M. Paige.
Clerk, treasurer's office,	Luther R. Putney.
Assistant engineer,	Percy C. Schroyer.
Stenographer, Department of Agricultural Economics,	Harriet C. Stevenson.
Extension instructor in animal husbandry,	George F. E. Story.
Stenographer, treasurer's office,	Dorothy Tyacke.

¹ Resignation to take effect Dec. 31, 1915.² Relieved from duty by United States War Department.TABLE III. — *Change in Title of Officers of the Institution.*

NAME.	Former Title.	Present Title.
Paul J. Anderson, . . .	Instructor in botany, . . .	Assistant professor of botany.
Edgar L. Ashley, . . .	Assistant professor of German, .	Associate professor of German.
Harold D. Baldinger, . .	Assistant in dairying, . . .	Instructor in dairying.
Alexander E. Cance, . .	Associate professor of agricultural economics.	Professor of agricultural economics.
Walter W. Chenoweth, . .	Assistant professor of pomology,	Associate professor of pomology.
Guy C. Crampton, . . .	Associate professor of entomology.	Professor of insect morphology.
Benjamin W. Ellis, . . .	Extension instructor in farm demonstration.	Assistant State leader.
Lina E. Fisher, . . .	Stenographer, Department of Chemistry.	Clerk, Department of Chemistry.

TABLE III. — *Change in Title of Officers of the Institution* — Concluded.

NAME.	Former Title.	Present Title.
Grace E. Gallond, . . .	Stenographer, experiment station.	Clerk, Department of Dairying.
Alice M. Gilbert, . . .	Clerk, Department of Dairying,	First clerk, Division of Agriculture.
Christian I. Gunness, . . .	Associate professor of rural engineering.	Professor of rural engineering.
Sidney B. Haskell, . . .	Associate professor of agronomy,	Professor of agronomy.
Lorian P. Jefferson, . . .	Expert secretary, Division of Rural Social Science.	Research secretary, Division of Rural Social Science.
Anderson A. Mackimmie, . . .	Assistant professor of French, . . .	Associate professor of French.
Walter E. Prince, . . .	Instructor in English, . . .	Assistant professor of English.
William S. Regan, . . .	Assistant in entomology, . . .	Instructor in entomology.

TABLE IV. — *Speakers for the Year.**A. Speakers at Wednesday Assembly for Year ending Nov. 30, 1915.***1914.**

- Dec. 2. — Pres. Kenyon L. Butterfield.
 Dec. 9. — Prof. William L. Machmer, M. A. C.
 Dec. 16. — Mr. Jewell B. Knight, M. A. C., 1892, Poona, India.

1915.

- Jan. 6. — Memorial service in memory of Dean George F. Mills.
 Jan. 13. — Mr. Albert Blair, Brooklyn, N. Y.
 Jan. 20. — Mr. Warren P. Landers, Boston.
 Feb. 3. — Dr. David Snedden, Boston, Massachusetts Commissioner of Education.
 Feb. 10. — Prof. E. L. Morgan, M. A. C.
 Feb. 17. — Prof. Frank A. Updyke, Dartmouth College.
 Feb. 24. — Pres. Kenyon L. Butterfield.
 Mar. 3. — Prof. Frank A. Waugh, M. A. C.
 Mar. 10. — Dean Edward M. Lewis, M. A. C.
 Apr. 7. — Pres. Kenyon L. Butterfield.
 Apr. 14. — Mr. John D. Willard, Greenfield, Mass.
 Apr. 28. — Hon. Charles M. Gardner, Westfield, Mass.
 May 5. — Mr. Samuel Gompers, Washington, D. C.
 May 12. — Mr. George D. Leavens, M. A. C., 1897, New York City.
 May 19. — Prof. Robert J. Sprague, M. A. C.
 May 26. — Pres. Kenyon L. Butterfield.
 Sept. 22. — Pres. Kenyon L. Butterfield.
 Sept. 29. — Dean Edward M. Lewis, M. A. C.
 Oct. 6. — Pres. Kenyon L. Butterfield.
 Oct. 13. — Student forum.
 Oct. 20. — Prof. Walton H. Hamilton, Amherst College.
 Oct. 27. — Chancellor David Starr Jordan, Leland Stanford University.
 Nov. 3. — Pres. Kenyon L. Butterfield.
 Nov. 10. — Rev. Lyman Abbott, D.D., New York City.

*B. Speakers at Sunday Chapel for Year ending Nov. 30, 1915.***1914.**

- Dec. 6. — Rev. Jason N. Pierce, Dorchester, Mass.
 Dec. 13. — Rev. William I. Chamberlain, New York City.

1915.

- Jan. 10. — Rev. Arthur C. Baldwin, Boston.
 Jan. 17. — Bishop John W. Hamilton, Boston.

1915.

- Jan. 24. — Rev. Neil McPherson, Springfield.
 Feb. 7. — Rev. Fleming James, Englewood, N. J.
 Feb. 14. — Dr. Frederick Lynch, New York City.
 Feb. 21. — Dr. Charles Fleischer, Boston.
 Feb. 28. — Rev. George Hodges, D.D., Newton, Mass.
 Mar. 7. — Rev. Frank M. Sheldon, Boston.
 Mar. 14. — Mr. Charles D. Hurrey, New York City.
 Mar. 21. — Rev. John W. Hoag, New Haven, Conn.
 Apr. 11. — Rev. Carl S. Patton, Columbus, O.
 Apr. 18. — Mr. Owen R. Lovejoy, New York City.
 Oct. 3. — Pres. Kenyon L. Butterfield.
 Nov. 7. — Hon. William H. Taft, New Haven, Conn.
 Nov. 14. — Rev. Samuel A. Eliot, Boston.
 Nov. 21. — Rev. Albert P. Fitch, D.D., Cambridge, Mass.

TABLE V. — *Attendance.**A. In Work of College Grade.*

	Registration Nov. 30, 1914.	Registration Nov. 30, 1915.
Senior class,	103	108
Junior class,	113	110
Sophomore class,	142	162
Freshman class,	168	211
	526	591
Graduate students,	52	52
Unclassified students,	32	25
Total doing work of college grade,	610	668

B. Short-course Enrollment and Convention Registration.

	1914.	1915.
Winter school,	182	182
Summer school,	146	162
Apple-packing school,	30	19
School for tree wardens,	22	—
Farmers' week,	1,563	—
School for rural social service,	22	14
School for library workers,	—	25
Boys' camps,	47	92
Girls' camps,	—	13
Polish farmers' day,	86	—
Poultry convention,	586	600
Conference on rural community planning,	329	261
Convention of county agents and agricultural instructors,	28	38
Total,	3,041	1,406

TABLE VI. — *Legislative Budget, 1915.*

ITEMS.	Amount asked.	Amount granted.
Special appropriations: —		
Addition to the power plant,	\$30,000	\$10,000
Miscellaneous additions,	10,000	—
Student dormitory,	40,000	—
Laboratory for microbiology,	67,500	67,500
	\$147,500	\$77,500

There was also submitted a bill requesting an appropriation of \$200,000 a year for six years for buildings and other improvements; this request was not granted.

TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1915.*A. *Home Addresses of Students (classified by Towns and Cities).*

Acushnet, 1	Hingham, 1	PITTSFIELD, 1
Amesbury, 1	Holliston, 1	Plainville, 1
Amherst, 5	Hopedale, 1	PORTLAND, ME., 1
Arlington, 3	Hudson, 1	Proctor, Vt., 1
ATLANTA, GA., 1	Kensington, Conn., . . . 1	PROVIDENCE, R. I., . . . 2
Avon, 1	Lakeville, 1	Putnam, Conn., 1
Ayer, 1	Leominster, 3	QUINCY, 4
BALTIMORE, MD., 1	Leverett, 1	Randolph, 1
Barnstable, 1	Lima, N. Y., 1	Reading, 1
BEVERLY, 1	Longmeadow, 1	RICHMOND HILL, N. Y., . 1
BOSTON, 19	LYNN, 8	Rockfall, Conn., 1
Bourne, 1	MALDEN, 3	Rockland, 3
Braintree, 2	Marion, 1	Schenevus, N. Y., 1
Brimfield, 1	MELROSE, 8	Sharon, 2
BROCKTON, 1	Mendon, 1	Shelburne, 1
Brookline, 2	Merrimac, 1	Sherborn, 1
CAMBRIDGE, 3	Methuen, 1	SOMERVILLE, 9
Chester, 1	Milford, 4	Southbridge, 1
Chester, Pa., 1	Milton, 1	SPRINGFIELD, 6
Chesterfield, 1	Monson, 1	Suffield, Conn., 1
Colrain, 1	Montague, 1	Sunderland, 2
Danvers, 1	Millville, N. J., 1	TAUNTON, 1
Darien, Conn., 1	Nantucket, 1	Tolland, 1
Dedham, 1	Needham, 1	Topsfield, 1
Deerfield, 2	NEW BENFORD, 1	Townsend, 1
Durham, Conn., 1	NEWBURYPORT, 1	TROY, N. Y., 1
EAST ORANGE, N. J., . . . 2	New Canaan, Conn., . . . 1	Upton, 1
EVERETT, 1	New Marlborough, 1	Uxbridge, 1
FALL RIVER, 2	NEWTON, 5	WALTHAM, 2
Falmouth, 1	Newtown, Conn., 1	Warren, 2
FITCHBURG, 1	NORTHAMPTON, 4	Wenham, 1
Framingham, 3	North Attleborough, . . . 1	Westfield, 2
Great Barrington, 2	Northbridge, 1	West Springfield, 2
Greenfield, 3	North Reading, 1	Weymouth, 3
Groton, 2	Norwich, Conn., 1	Williamstown, 1
Hammondon, N. J., 1	Orange, 1	Wilson, Conn., 1
Hanover, 1	Orleans, 1	Winchendon, 1
HAVANA, CUBA, 1	Oxford, 1	Winchester, 1
HAVERHILL, 2	PATERSON, N. J., 1	WORCESTER, 2

B. Home Addresses (classified by States).

	Number.	Per Cent.		Number.	Per Cent.
Connecticut, . . .	11	5.21	New York, . . .	4	1.90
Georgia, . . .	1	.47	Pennsylvania, . . .	1	.47
Maine, . . .	1	.47	Rhode Island, . . .	2	.95
Maryland, . . .	1	.47	Vermont, . . .	1	.47
Massachusetts, . . .	183	86.73	Cuba, . . .	1	.47
New Jersey, . . .	5	2.37		211	99.98

C. Home Addresses (classified by Counties of Massachusetts).

	Number.	Per Cent.		Number.	Per Cent.
Barnstable, . . .	3	1.64	Middlesex, . . .	47	25.68
Berkshire, . . .	5	2.73	Nantucket, . . .	1	.55
Bristol, . . .	6	3.28	Norfolk, . . .	19	10.38
Essex, . . .	18	9.83	Plymouth, . . .	8	4.37
Franklin, . . .	12	6.56	Suffolk, . . .	19	10.38
Hampden, . . .	15	8.20	Worcester, . . .	20	10.93
Hampshire, . . .	10	5.46		183	99.99

D. Nativity of Parents.

	Number.	Per Cent.
Neither parent foreign born,	158	74.88
Both parents foreign born,	32	15.17
Father (only) foreign born,	16	7.58
Mother (only) foreign born,	5	2.37
	211	100.00

E. Education of Father.

	Number.	Per Cent.
Common school,	93	44.08
High school,	61	28.91
Business school,	20	9.48
College or university,	35	16.59
No statistics,	2	.95
	211	100.01

F. Religious Census.

	MEMBERSHIP.		PREFERENCE.		TOTALS.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Baptist,	16	7.58	7	3.32	23	10.90
Catholic,	25	11.85	2	.95	27	12.80
Congregationalist,	54	25.59	23	10.90	77	36.49
Episcopal,	14	6.63	2	.95	16	7.58
Hebrew,	4	1.89	1	.47	5	2.37
Methodist,	18	8.53	9	4.27	27	12.80
Presbyterian,	3	1.42	1	.47	4	1.89
Unitarian,	7	3.32	4	1.89	11	5.21
Universalist,	2	.95	3	1.42	5	2.37
Miscellaneous,	7	3.32	7	3.32	14	6.63
	150	71.09	59	27.96	209	99.05
No statistics,	—	—	—	—	2	.95
	150	71.09	59	27.96	211	100.00

G. Occupation of Father.

	Number.	Per Cent.
Agriculture and horticulture,	33	15.64
Artisans,	50	23.70
Business,	61	28.91
Deceased or no statistics,	19	9.00
Miscellaneous,	21	9.95
Professional,	26	12.31
Retired,	1	.47
	211	99.98

H. Intended Vocation of Student.

	Number.	Per Cent.
Agriculture or horticulture (practical),	98	46.45
Agriculture or horticulture (professional),	69	32.70
Miscellaneous,	1	.47
Professions,	5	2.37
Undecided or no statistics,	38	18.01
	211	100.00

I. Farm Experience.

	Number.	Per Cent.
Brought up on a farm,	51	24.17
Not brought up on a farm, and having had no, or practically no, farm experience.	75	35.55
Not brought up on a farm, but having had some farm experience.	85	40.28
	211	100.00

J. Miscellaneous Statistics.

Average age,	19.15 years.
Number signifying their intention to seek student labor,	130 (61.61 per cent.)
Number boarding at the college dining hall,	165 (78.20 per cent.)

TABLE VIII. — *Entrance Statistics of Freshman Class.*

Number of applications,	411
Admitted,	239
Matriculated,	211
Failed to report,	28
Total,	239
Rejected,	172
Total,	411
Matriculated on certificate,	92
Matriculated on examination,	23
Matriculated on certificate and examination,	83
Matriculated on credentials from another college,	6
Re-entered,	7
	211
Matriculated without condition,	129
Matriculated with condition,	82
	211

TABLE IX. — *Official Visits by Outside Organizations.*

Connecticut Valley Breeders' Association.
Massachusetts State Poultry Association, Inc.
Massachusetts Poultry Society.
Massachusetts Federation for Rural Progress.
Massachusetts Agricultural Development Committee.
Massachusetts Homestead Commission.
Massachusetts Committee on Rural Resources.
Massachusetts Collegiate Country Life Club.
Rural Church Committee of the Congregational Church.
The Northampton and Holyoke Gardeners' and Florists' Club.
Vocational Agricultural Instructors.

September 15 to October 1:—															
House cases,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19
Out-patients,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4
October 1 to November 1:—															
House cases,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	72
Out-patients,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	48
November 1 to December 1:—															
House cases,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26
Out-patients,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	36
Number of house cases,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	117
Number of out-patients,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	88
															205
Total,															
															205
Number cared for in the house,															
															19
Number cared for as out-patients,															
															37
Total,															
															56

REPORT OF THE TREASURER

. FOR THE FISCAL YEAR ENDING NOV. 30, 1915.

BALANCE SHEET.

	DR.	CR.
1914.		
Dec. 1. To balance on hand,	\$44,255 00	
1915.		
Nov. 30. To receipts for fiscal year,	728,188 79	\$719,304 72
Expenditures for fiscal year,		53,139 07
Balance on hand,		
	\$772,443 79	\$772,443 79

SCHEDULE A. — INCOME.

	Items.	Totals.
Income from students and others,		\$85,998 51
Tuition fees,	\$3,479 00	
Laboratory fees,	5,648 50	
Rents,	5,833 26	
Department sales,	58,716 52	
Department transfers,	6,225 98	
Miscellaneous,	6,095 25	
Income from grants by nation and State: —		
State aid,		527,093 17
Income from endowment,	\$3,313 32	
Appropriation for current expenses,	228,000 00	
Administration,	\$31,000 00	
Maintenance,	90,000 00	
Instruction,	90,000 00	
Graduate school,	2,000 00	
Improvements,	10,000 00	
Additional land,	5,000 00	
Appropriation for extension service,	50,000 00	
Appropriation for experiment station,	31,000 00	
Maintenance,	\$25,000 00	
Feed law,	6,000 00	
Receipts from special appropriation,	214,779 85	
Federal aid,		82,098 70
Income from land grant of 1862,	\$7,300 00	
Income from Hatch fund of 1887,	15,000 00	
Income from Adams fund of 1906,	15,000 00	
Income from Nelson fund of 1907,	16,666 67	
Income from Morrill fund of 1890,	16,666 66	
Income from Smith-Lever fund of 1914,	11,465 37	

SCHEDULE A. — INCOME — *Concluded.*

	Items.	Totals.
Income from other sources: —		
Income from experiment station,		\$26,969 31
Fertilizer receipts,	\$10,088 00	
Agricultural receipts,	2,365 01	
Cranberry receipts,	2,437 01	
Chemical receipts,	10,732 09	
Miscellaneous receipts,	1,347 20	
Income from extension service,		6,029 10
Winter school receipts,	\$1,095 50	
Summer school receipts,	1,748 01	
Correspondence course receipts,	655 67	
Itinerary instruction receipts,	840 88	
Miscellaneous receipts,	1,689 04	
Total,		\$728,188 79

CLASSIFICATION OF INCOME FROM STUDENTS AND OTHERS.

	Laboratory Fees.	Department Sales.	Transfers.	Rent.	Income.	Miscellaneous.	Tuition.	Totals.
Agricultural economics,	-	\$17 25	-	-	-	-	-	\$17 25
Agricultural education,	-	96	-	-	-	-	-	96
Astronomy,	\$411 00	-	-	-	-	\$100 00	-	511 00
Animal husbandry,	180 00	-	-	-	-	100 00	-	280 00
Beekeeping,	-	97 09	\$6 70	-	-	-	-	103 79
Botany,	632 00	43 48	-	-	-	-	-	674 48
Chemistry,	2,883 00	57 56	20 72	-	-	-	-	2,961 28
Dairy,	112 00	17,867 38	617 20	-	-	-	-	18,696 58
Entomology,	110 50	3 56	-	-	-	100 00	-	114 06
Farm administration,	-	27 88	50	-	-	-	-	28 38
Floriculture,	-	2,951 36	35 84	-	-	100 00	-	3,087 20
Farm,	-	30,313 09	1,672 32	-	-	-	-	31,985 41
Forestry,	-	9 00	58 40	-	-	100 00	-	167 40
General horticulture,	-	31 57	3,464 23	-	-	323 50	-	3,819 30
Grounds,	-	507 70	-	-	-	-	-	507 70
Hospital,	-	-	-	-	-	30 77	-	30 77
Landscape gardening,	297 00	14 92	4 12	-	-	100 00	-	416 04
Language and literature,	-	40	-	-	\$417 09	-	-	40
Library,	-	174 58	16 04	-	-	-	-	607 71
Market gardening,	-	1,276 31	111 34	-	-	100 00	-	1,487 65
Mathematics,	72 00	-	18 00	-	-	-	-	90 00
Microbiology,	345 00	-	45 80	-	-	59 36	-	450 16
Military,	-	-	5 90	-	-	-	-	5 90
Physics,	-	93	-	-	-	-	-	93
Pomology,	137 50	1,540 27	27 95	-	-	100 00	-	1,805 72
Physical education,	-	1 25	-	-	-	-	-	1 25
Poultry husbandry,	90 50	3,372 24	7 23	-	-	100 93	-	3,570 90
Rural engineering,	-	-	6 56	-	-	100 00	-	106 56
Rural sociology,	-	1 40	-	-	-	-	-	1 40
Veterinary,	-	-	27 13	-	-	-	-	27 13
Zoology and geology,	378 00	34 00	2 75	-	-	-	-	414 75
Operating and maintenance,	-	-	7 60	-	-	-	\$3,479 00	3,486 60
North dormitory,	-	-	-	\$2,006 49	-	4,214 75	-	7,701 35
South dormitory,	-	-	-	2,435 35	-	-	-	2,006 49
College residences,	-	-	69 10	569 56	-	-	-	2,504 45
Executive order,	-	-	-	-	-	-	-	569 56
President's office,	-	-	55	-	-	48 85	-	48 85
Salaries,	-	-	373 34	-	-	-	-	373 34
Draper hall,	-	-	-	821 86	-	-	-	821 86
Totals,	\$5,648 50	\$58,313 18	\$6,509 32	\$5,833 26	\$417 09	\$5,678 16	\$3,479 00	\$85,198 51

SCHEDULE B. — EXPENDITURES FOR FISCAL YEAR.

	Items.	Totals.
College expenses,		\$342,659 93
Administration,	\$31,381 32	
Maintenance,	179,714 94	
Instruction,	131,563 67	
Experiment station,		88,178 87
Administration,	\$1,011 28	
Feed inspection,	5,337 54	
Fertilizer law,	10,047 01	
Salaries,	39,199 74	
Departments,	32,583 30	
Extension service, ¹		64,486 07
Salaries,	\$36,215 97	
Travel,	9,677 21	
Departments,	18,592 89	
Special appropriation,		223,636 67
Infirmary,	\$13,052 48	
Agricultural building,	176,629 92	
Sewers,	9,200 00	
Addition to power plant,	10,000 00	
Microbiology building,	14,754 27	
Miscellaneous,		343 18
Total,		\$719,304 72

¹ Made up from State Extension Service and Smith-Lever funds.

ANALYSIS OF COLLEGE EXPENDITURES.

ADMINISTRATION.				Office Expense.	Salaries and Labor.	Travel.	Minor Equipment.	Building Supplies.	Publicity and Lectures.	Student Activity.	Com-mence-ment.	Miscel-laneous.	Totals.
Dean's office, . . . . .	.	.	.	\$158 19	\$290 25	—	\$37 60	—	—	—	\$502 17	—	\$486 04
Executive order, . . . . .	.	.	.	—	—	\$1,932 48	—	—	\$1,197 84	\$1,102 03	—	\$3,180 82	7,915 34
President's office, . . . . .	.	.	.	728 88	154 95	49 85	—	\$4 31	—	—	—	—	937 99
Registrar's office, . . . . .	.	.	.	373 37	95 35	40 49	5 17	—	—	—	—	—	514 28
Treasurer's office, . . . . .	.	.	.	649 84	541 18	145 25	8 43	2 47	—	—	—	72 29	1,419 46
Administration (salaries), . . . . .	.	.	.	—	20,108 21	—	—	—	—	—	—	—	20,108 21
Totals, . . . . .	.	.	.	\$1,910 18	\$21,189 94	\$2,108 07	\$51 20	\$6 78	\$1,197 84	\$1,102 03	\$502 17	\$3,253 11	\$31,381 32

MAINTENANCE.				Office Supplies.	Labor.	Laboratory Supplies.	Refunds.	Minor Equipment.	Building Supplies.	Travel.	General Expense.	Miscel-laneous.	Salaries.	Totals.
Academic maintenance:—	.	.	.	\$117 98	\$17 48	\$5 23	—	\$9 21	—	\$14 55	—	—	—	\$164 45
Agricultural economics, . . . . .	.	.	.	156 45	160 35	95 98	—	2 50	—	92 10	—	—	—	508 11
Agricultural education, . . . . .	.	.	.	76 32	99 08	201 26	\$17 50	23 52	—	28 12	—	—	—	445 80
Agronomy, . . . . .	.	.	.	133 28	138 46	114 33	5 00	32 83	—	119 85	—	—	—	643 75
Animal husbandry, . . . . .	.	.	.	141 13	998 55	223 77	—	134 63	\$95 21	4 00	—	—	—	1,597 29
Beekeeping, . . . . .	.	.	.	146 11	457 00	644 43	41 00	31 75	49 62	16 15	—	—	—	1,886 06
Botany, . . . . .	.	.	.	196 65	1,027 95	2,616 77	647 57	79 13	92 98	—	—	—	—	4,661 05
Chemistry, . . . . .	.	.	.	151 92	1,586 38	19,642 11	28 26	327 32	105 66	75 76	—	—	—	21,917 41
Dairying, . . . . .	.	.	.	22 66	—	13 74	—	—	—	—	—	—	—	36 40
Economics and sociology, . . . . .	.	.	.	30 01	300 17	199 76	6 00	45 17	—	34 47	—	—	—	732 70
Entomology, . . . . .	.	.	.	144 05	286 16	50 54	—	49 91	—	20 21	—	—	—	585 11
Farm administration, . . . . .	.	.	.	120 01	3,037 63	1,202 10	—	65 32	—	99 05	—	—	—	4,669 08
Floriculture, . . . . .	.	.	.	80 42	81 59	75 05	—	24 57	—	66 09	—	—	—	327 72
Forestry, . . . . .	.	.	.	5 27	—	—	—	—	—	—	—	—	—	5 27
History and government, . . . . .	.	.	.	—	—	—	—	—	—	—	\$741 11	—	—	741 11
Hospital, . . . . .	.	.	.	—	—	—	—	—	—	—	—	—	—	—
Landscape gardening, . . . . .	.	.	.	65 63	16 52	327 30	2 50	13 93	—	20 47	—	—	—	446 35

CURRENT ACCOUNTS.

Disbursements and Receipts.

ACCOUNTS.	Disbursements from Nov. 30, 1914, to Nov. 30, 1915.	Receipts from Nov. 30, 1914, to Nov. 30, 1915.	Apportionment for Year ending Nov. 30, 1915.	Balance to Credit.
Administration:—				
Dean's office,	\$486 04	—	\$500 00	\$13 96
Executive order,	7,915 34	\$48 55	5,800 00	—2,066 49
President's office,	937 99	55	900 00	—37 44
Registrar's office,	514 28	—	500 00	—14 28
Salaries,	20,108 21	—	20,100 00	—8 21
Treasurer's office,	1,419 46	—	1,200 00	—219 46
State Treasurer,	—	31,000 00	—	—
Maintenance, academic:—				
Agricultural economics,	164 45	17 25	175 00	27 80
Agricultural education,	508 11	96	500 00	—7 15
Agromony,	445 80	511 00	150 00	215 20
Animal husbandry,	543 75	280 00	300 00	36 25
Beekeeping,	1,597 29	103 79	1,500 00	6 50
Botany,	1,386 06	674 48	750 00	38 42
Chemistry,	4,661 05	2,961 28	2,000 00	300 23
Dairying,	21,917 41	18,696 58	3,600 00	379 17
Economics and sociology,	36 40	—	50 00	13 60
Entomology,	732 70	114 06	775 00	156 36
Farm administration,	585 11	28 38	650 00	93 27
Floriculture,	4,669 08	3,087 20	1,100 00	—481 88
Forestry,	327 72	167 40	400 00	239 68
History and government,	5 27	—	—	—5 27
Hospital,	741 11	30 77	1,100 00	389 66
Landscape gardening,	446 35	416 04	—	—30 31
Language and literature,	169 80	40	350 00	180 60
Market gardening,	3,644 91	1,487 65	2,000 00	—157 26
Mathematics,	263 66	90 00	225 00	51 34
Microbiology,	691 26	450 16	250 00	8 90
Military science,	1,310 48	5 90	1,300 00	—58
Physical education,	922 69	1 25	600 00	—321 44
Physics,	586 38	93	500 00	—85 45
Pomology,	3,472 54	1,805 72	1,700 00	33 18
Poultry husbandry,	6,405 28	3,570 90	2,500 00	—334 38
Rural engineering,	461 98	106 56	350 00	—5 42
Rural sociology,	94 00	1 40	50 00	—42 60
Veterinary science,	1,235 66	27 13	1,000 00	—208 53
Zoölogy and geology,	774 76	414 75	325 00	—35 01
Maintenance, general:—				
Equipment, 1915,	7,737 96	—	10,000 00	2,262 04
Farm,	31,441 99	31,985 41	—	543 42
General horticulture,	7,234 72	3,819 30	2,800 00	—615 42
Graduate school,	82 26	—	100 00	17 74
Grounds,	3,616 53	507 70	3,500 00	391 17
Improvements, 1915,	7,455 01	10,000 00	10,000 00	2,544 99
Library,	6,804 27	607 71	6,500 00	303 44
Operating and maintenance,	56,541 14	13,603 71	52,000 00	11,734 91
State Treasurer, maintenance,	—	90,000 00	—	—
Land,	—	5,000 00	—	—
Endowment fund,	—	10,613 32	—	—
Instruction:—				
Salaries,	131,563 67	373 34	—	—
United States Treasurer:—				
Morrill fund,	—	16,666 66	—	—
Nelson fund,	—	16,666 67	—	—
State Treasurer:—				
Instruction,	—	90,000 00	—	—
Graduate school,	—	2,000 00	—	—
Totals,	\$342,659 93	\$357,945 16	—	—
Balance beginning fiscal year Dec. 1, 1914,	—	16,072 43	—	—
Balance on hand Nov. 30, 1915,	31,357 66	—	—	—
	\$374,017 59	\$374,017 59	—	—

COLLEGE ACCOUNTS.

Comparative Disbursements and Receipts for 1914-15.

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1914.	1915.	1914.	1915.
Agricultural economics,	\$103 16	\$164 45	-	\$17 25
Agricultural education,	386 65	508 11	\$58 00	96
Agronomy,	294 91	445 80	177 70	511 00
Animal husbandry,	593 44	543 75	176 50	280 00
Beekeeping,	1,076 10	1,597 29	8 15	103 79
Botany,	1,461 43	1,386 06	621 45	674 48
Chemistry,	4,499 79	4,661 05	2,655 14	2,961 28
Dairying,	16,549 52	21,917 41	13,296 38	18,696 58
Dean's office,	511 24	486 04	-	-
Economics and sociology,	32 65	36 40	-	-
Entomology,	664 03	732 70	125 47	114 06
Equipment,	11,271 71	7,737 96	115 00	-
Executive order,	6,196 47	7,915 34	2 50	48 85
Farm administration,	377 12	585 11	2 94	28 38
Farm,	28,869 16	31,441 99	21,211 36	31,985 41
Floriculture,	4,005 47	4,669 08	2,991 24	3,087 20
Forestry,	402 60	327 72	65 10	167 40
General horticulture,	4,316 98	7,234 72	1,681 26	3,819 30
Graduate school,	90 99	82 26	-	-
Grounds,	3,026 66	3,616 53	30 16	507 70
History and government,	10 61	5 27	-	-
Hospital,	-	741 11	-	30 77
Improvements,	8,508 96	7,455 01	64 44	-
Landscape gardening,	394 56	446 35	397 67	416 04
Language and literature,	286 59	169 80	-	40
Library,	6,761 82	6,804 27	570 73	607 71
Market gardening,	3,763 96	3,644 91	1,604 54	1,487 65
Mathematics,	172 83	263 66	-	90 00
Military,	1,326 46	1,310 48	-	5 90
Microbiology,	901 10	691 26	301 10	450 16
Physical education,	715 90	922 69	123 50	1 25
Physics,	645 52	586 38	-	93
Pomology,	3,847 29	3,472 54	1,464 67	1,805 72
Poultry husbandry,	5,080 67	6,405 28	3,215 00	3,570 90
President's office,	872 49	937 99	50	55
Registrar's office,	439 25	514 28	-	-
Rural engineering,	96 33	461 98	-	106 56
Rural sociology,	40 76	94 00	-	1 40
Salaries,	144,894 92	151,671 88	236 81	373 34
Treasurer's office,	1,253 40	1,419 46	17	-
Veterinary,	996 53	1,235 66	14 82	27 13
Zoölogy and geology,	772 70	774 76	351 17	414 75
Operating and maintenance,	49,640 03	56,541 14	10,936 02	13,603 71
State Treasurer:—				
Endowment fund,	-	-	10,613 32	10,613 32
Graduate school,	-	-	2,000 00	2,000 00
Maintenance,	-	-	93,000 00	105,000 00
Instruction,	-	-	85,000 00	90,000 00
Administration,	-	-	30,000 00	31,000 00
United States Treasurer:—				
Morrill fund,	-	-	16,666 66	16,666 66
Nelson fund,	-	-	16,666 67	16,666 67
Totals,	\$316,752 76	\$342,659 93	\$316,446 14	\$357,945 16
Balance beginning fiscal year,	-	-	16,379 05	16,072 43
Balance on hand at close of fiscal year,	16,072 43	31,357 66	-	-
	\$332,825 19	\$374,017 59	\$332,825 19	\$374,017 59

COLLEGE ACCOUNTS — *Concluded.**Summary.*

	Disbursements.	Credits.
Cash on hand Dec. 1, 1914,	—	\$16,072 43
Institution receipts Nov. 30, 1915,	—	85,998 51
State Treasurer receipts Nov. 30, 1915,	—	238,613 32
United States Treasurer's receipts Nov. 30, 1915,	—	33,333 33
Total disbursements,	\$342,659 93	—
	\$342,659 93	\$374,017 59
Bills receivable Dec. 1, 1914, deducted,	—	6,855 03
Bills payable Dec. 1, 1914, deducted,	2,893 65	—
	\$339,766 28	\$367,162 56
Bills receivable Nov. 30, 1915,	—	5,669 36
Bills payable Nov. 30, 1915,	2,742 27	—
Balance,	30,323 37	—
	\$372,831 92	\$372,831 92

COLLEGE EQUIPMENT, 1915.

	Dis- burse- ments Fiscal Year.		Dis- burse- ments Fiscal Year.
Dairy,	\$1,767 60	Floriculture,	\$190 75
Physics,	407 46	Hospital,	760 05
Horticulture,	88 00	Agricultural economics,	62 90
Market gardening,	75 75	Pomology,	368 73
Library,	155 01	Language and literature,	198 18
Microbiology,	498 30	Operating and maintenance,	75 00
Chemistry,	397 95	Mathematics,	50 00
Farm,	575 02	Registrar's office,	25 00
Zoology,	232 20	Agronomy,	27 35
Veterinary,	338 05	Landscape gardening,	299 40
Poultry,	829 54	Rural sociology,	97 18
Botany,	153 85		
Forestry,	49 50	Total,	\$7,737 96
Beekeeping,	15 19		

FARM DISBURSEMENTS.

	Labor.	Equipment.	Feed.	Fertilizer.	Seeds.	Miscellaneous.	Supplies.	Improvements.	Totals.
Cattle,	\$5,750 19	-	\$2,669 21	-	-	-	\$726 37	-	\$9,154 77
Dairy,	1,833 88	\$21 09	-	-	-	-	2,248 39	-	4,103 36
Horses,	1,607 80	-	480 00	-	-	-	1,079 94	-	3,167 74
Sheep,	225 25	-	-	-	-	-	11 10	-	236 35
Swine,	401 92	-	577 51	-	-	-	64 79	-	1,044 22
Field crops,	3,864 62	-	-	\$857 67	\$232 97	-	58 70	-	5,013 96
Miscellaneous,	2,082 52	-	-	-	-	-	99 38	\$1,344 58	3,526 48
Tools and machinery,	-	485 19	-	-	-	-	-	-	485 19
Live stock,	-	-	-	-	-	-	-	-	-
Supplies,	-	-	-	-	-	-	4,709 92	-	4,709 92
Totals,	\$15,775 18	\$506 28	\$3,726 72	\$857 67	\$232 97	-	\$8,998 59	\$1,344 58	\$31,441 99

FARM CREDITS.

	Milk.	Stock.	Sundry.	Hay.	Roots.	Labor.	Potatoes.	Totals.
Cattle,	\$13,737 90	-	\$283 97	-	-	-	-	\$14,021 87
Dairy,	13,086 68	-	1 70	-	-	-	-	13,088 38
Horses,	-	\$640 00	884 21	-	-	-	-	1,524 21
Sheep,	-	55 00	54 14	-	-	-	-	109 14
Swine,	-	344 63	7 50	-	-	-	-	352 13
Field crops,	-	-	60	\$927 07	\$33 84	-	\$739 23	1,700 64
Miscellaneous,	-	-	181 14	-	-	\$1,007 90	-	1,189 04
Totals,	\$20,824 58	\$1,039 63	\$1,413 16	\$927 07	\$33 84	\$1,007 90	\$739 23	\$31,985 41

AGRICULTURAL DIVISION.

Disbursements and Receipts.

	Disbursements.	Receipts.
Agronomy,	\$445 80	\$511 00
Animal husbandry,	543 75	280 00
Dairying,	21,917 41	18,696 58
Farm,	31,441 99	31,985 41
Farm administration,	585 11	28 38
Poultry husbandry,	6,405 28	3,570 90
Rural engineering,	461 98	106 56
Division totals,	\$61,801 32	\$55,178 83

Summary.

	DR.	CR.
By total division receipts,		\$55,178 83
By bills receivable,		3,748 14
By net apportionment,		7,200 00
To total disbursements,	\$61,801 32	
To bills payable,	1,383 16	
Balance,	2,942 49	
	\$66,126 97	\$66,126 97

Inventory of Quick Assets.

	Nov. 30, 1914.	Nov. 30, 1915.
Inventory of produce,	\$8,938 35	\$11,518 42
Inventory of cattle,	13,645 00	14,945 00
Inventory of swine,	375 00	900 00
Inventory of horses,	5,450 00	5,425 00
Inventory of poultry,	941 25	1,162 25
Inventory of sheep,	647 00	591 00
	\$29,996 60	\$34,541 67

HORTICULTURAL DIVISION.

Disbursements and Receipts.

	Disbursements.	Receipts.
Floriculture,	\$4,669 08	\$3,087 20
Forestry,	327 72	167 40
General horticulture,	7,234 72	3,819 30
Grounds,	3,616 53	507 70
Landscape gardening,	446 35	416 04
Market gardening,	3,644 91	1,487 65
Pomology,	3,472 54	1,805 72
Division totals,	\$23,411 85	\$11,291 01

HORTICULTURAL DIVISION—*Concluded.**Summary.*

	DR.	CR.
By total division receipts,		\$11,291 01
By bills receivable,		1,094 09
By apportionment,		11,500 00
To total division disbursements,	\$23,411 85	
To bills payable,	788 88	
By balance,		315 63
	\$24,200 73	\$24,200 73

Inventory of Quick Assets.

	Nov. 30, 1914.	Nov. 30, 1915.
Floriculture,	\$523 50	\$550 00
Market gardening,	107 50	121 50
Pomology,	612 50	375 00
General horticulture (live stock),	1,625 00	1,695 00
	\$2,868 50	\$2,741 50

EXPENSE OPERATING AND MAINTENANCE.

	Salaries.	Labor.	Fuel and Water.	Repairs.	Supplies.	Tools.	Architect.	Engineer.	Miscellaneous.	Totals.
General: —										
General superintendent,	\$2,841 83	—	—	—	—	—	—	—	—	\$2,841 83
Office,	—	\$887 80	—	—	—	—	—	—	—	887 80
General expenses,	—	—	—	—	\$2,672 34	—	—	—	—	2,672 34
Power plant: —										
Heat,	—	4,414 38	\$22,771 62	\$855 40	16 50	—	—	—	—	28,057 90
Light,	—	347 01	—	893 27	105 93	—	—	—	—	1,346 21
Tools,	—	5 80	—	—	—	\$409 89	—	—	—	409 89
Waiting station janitor,	—	—	—	—	—	—	—	—	—	5 80
Amherst Water Company,	—	—	2,027 10	—	—	—	—	—	—	2,027 10
Night watchman,	—	1,318 32	—	—	—	—	—	—	—	1,318 32
Mail service,	—	325 84	—	—	—	—	—	—	—	325 84
Water mains,	—	748 51	—	—	—	—	—	—	—	748 51
Steam mains,	—	155 09	—	—	—	—	—	—	—	155 09
Sewers and cesspools,	—	22 34	—	—	—	—	—	—	—	22 34
Amherst Gas Company,	—	—	81 43	—	—	—	—	—	—	81 43
Electric light circuit,	—	240 16	—	—	—	—	\$1,403 63	\$50 00	—	240 16
Expert service,	—	—	—	—	—	—	—	—	—	1,453 63
Walks,	—	21 98	—	—	—	—	—	—	—	21 98
Emergency maintenance,	—	1,326 37	—	—	—	—	—	—	—	1,326 37
Drains,	—	6 25	—	—	—	—	—	—	—	6 25
Fire department,	—	16 35	—	—	112 08	—	—	—	—	1,167 07
Sundry,	1,034 28	—	—	—	—	—	—	—	\$4 36	2,594 27
Totals,	\$3,876 11	\$9,836 20	\$24,880 15	\$1,748 67	\$2,906 85	\$409 89	\$1,403 63	\$50 00	\$2,598 63	\$47,710 13

EXPENSE OPERATING AND MAINTENANCE — Continued.

COLLEGE BUILDINGS.	Electric Repairs.	Plumbing Repairs.	Heat Repairs.	C. and M. Repairs.	Janitor.	Bell Ringing.	Sundry.	Totals.
College buildings:—								
Animal husbandry building,		\$13 74	\$1 34	\$7 42	—	—	—	\$25 50
Horse barn,	\$0 77	4 31	6 79	13 84	—	—	—	25 71
Dairy barn,	6 43	33 10	7 10	33 43	—	—	—	80 06
Young stock barn,	97	9 29	75	60 78	—	—	—	71 79
Power building,	—	23 35	—	214 80	\$151 59	—	—	380 74
Chemical building,	53	34 83	21 56	78 98	—	—	—	135 90
Poultry building,	1 83	8 10	—	22 74	—	—	—	32 67
Poultry building,	21 29	55 22	32 09	423 42	—	—	—	532 02
Drill hall,	2 19	23 93	5 31	79 52	—	—	—	110 95
Veterinary building,	—	4 41	19 44	73 54	—	—	—	97 39
Apiary building,	5 02	1 61	1 49	93 96	—	—	—	102 08
Mathematic building,	26	7 49	7 37	36 02	—	—	—	51 14
Entomology building,	4 47	21 09	11 48	262 56	—	—	—	299 60
Clark hall,	5 86	52 77	2 78	46 58	—	—	—	107 99
French hall,	23 29	9 00	45 04	434 70	—	—	—	512 03
Wilder hall,	16 08	15 63	1 51	29 07	—	—	—	62 29
Upper plant house,	—	59 03	11 82	37 66	—	—	—	128 31
Old Durfee range,	—	8 36	6 31	33 83	—	—	—	48 50
Horticulture barn,	31	46 30	6 65	19 57	—	—	—	72 83
Physics building,	—	20 24	4 00	44 39	—	—	—	68 63
East experiment station,	1 16	56 38	47 39	357 58	—	—	—	462 51
West experiment station,	3 71	31 77	12 16	64 49	—	—	—	112 13
Experiment station barn,	—	1 71	11 90	18 66	—	—	—	32 27
P. and A. chemistry barn,	28	26 53	3 19	89 28	—	—	—	119 28
Microbiology building,	24	—	61	—	—	—	\$680 00	680 85
Draper hall,	48 14	260 02	53 17	142 54	—	—	168 25	672 12
Sheep barn,	—	—	—	7 31	—	—	—	7 31
Piggery,	—	7 66	—	2 81	—	—	—	10 47
Cold-storage building,	—	11 72	—	79 37	—	—	—	91 09
Machine barn,	—	1 82	—	3 25	—	—	—	5 07
Hospital,	3 37	54	3 97	43 95	—	—	73 54	125 37
Rural engineering building,	—	41	—	—	—	—	—	41
Stockbridge hall,	—	—	1 34	42	—	—	—	1 76
North College,	59 27	32 65	17 07	195 45	577 32	—	135 40	1,017 16
South College,	57 09	67 25	22 00	403 28	559 13	—	136 85	1,245 60
Chapel,	36 01	6 37	45	56 84	240 40	\$120 00	10 00	470 07

EXPERIMENT STATION.
Disbursements and Receipts.

ACCOUNTS.	Disbursements from Dec. 1, 1914, to Nov. 30, 1915.	Receipts from Dec. 1, 1914, to Nov. 30, 1915.	Apportionment for Year ending Nov. 30, 1915.	Balance to Credit.
Administration,	\$1,011 28	\$34 72	\$1,400 00	\$423 44
Agriculture,	5,247 13	2,365 01	2,575 00	—307 12
Asparagus,	701 48	—	500 00	—201 48
Botanical,	1,469 01	3 00	1,500 00	33 99
Chemical,	11,015 52	10,732 09	1,000 00	716 57
Cranberry,	3,015 05	2,437 01	3,000 00	2,421 96
Entomology,	477 98	—	600 00	122 02
Feed inspection,	5,337 54	6,000 00	—	—
Fertilizer inspection,	10,047 01	10,088 00	—	—
Freight and expense,	311 55	32	400 00	88 77
Graves orchard,	737 73	1,027 19	800 00	1,089 46
Horticultural,	1,803 75	187 64	1,600 00	—16 11
Library,	855 91	—	700 00	—155 91
Meteorology,	278 49	—	375 00	96 51
Poultry,	2,034 82	4 33	1,700 00	—330 49
Publication,	818 66	—	800 00	—18 66
Salaries,	39,199 74	—	38,481 65	—718 09
Treasurer's office,	377 87	—	375 00	—2 87
Veterinary,	238 11	—	1,925 00	1,686 89
Agricultural economics,	605 94	—	1,000 00	394 06
Microbiology,	773 08	—	800 00	26 92
Equipment,	1,821 22	—	2,000 00	178 78
Miscellaneous,	—	90 00	—	—
Hatch fund,	—	15,000 00	—	—
Adams fund,	—	15,000 00	—	—
State fund,	—	25,000 00	—	—
Totals,	\$88,178 87	\$87,969 31	\$61,531 65	\$3,528 64
Balance on hand beginning fiscal year, Dec. 1, 1914,	—	8,286 85	—	—
Balance on hand Nov. 30, 1915,	8,077 29	—	—	—
	\$96,256 16	\$96,256 16	—	—

EXPERIMENT STATION—Continued.

Comparative Disbursements and Receipts, 1914-15.

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1914.	1915.	1914.	1915.
Administration,	\$1,416 13	\$1,011 28	\$4 92	\$34 72
Agriculture,	5,058 48	5,247 13	2,494 49	2,365 01
Asparagus,	757 60	701 48	—	—
Botanical,	1,895 80	1,469 01	50 00	3 00
Chemical,	10,252 46	11,015 52	10,013 33	10,732 09
Cranberry,	2,886 76	3,015 05	2,676 86	2,437 01
Entomology,	556 56	477 98	4 50	—
Feed inspection,	5,897 93	5,337 54	6,018 67	6,000 00
Fertilizer inspection,	9,744 92	10,047 01	11,112 00	10,088 00
Freight and express,	532 56	311 55	24 55	32
Graves orchard,	789 08	737 73	129 25	1,027 19
Horticultural,	1,936 83	1,803 75	11 46	187 64
Library,	248 75	855 91	—	—
Meteorology,	374 24	278 49	—	—
Poultry,	1,066 63	2,034 82	4 17	4 33
Publications,	912 47	818 66	—	—
Salaries,	36,202 83	39,199 74	18 67	—
Treasurer's office,	364 44	377 87	—	—
Veterinary,	597 15	238 11	—	—
Equipment,	—	1,821 22	—	—
Agricultural economics,	—	605 94	—	—
Microbiology,	—	773 08	—	—
Miscellaneous,	96 30	—	160 00	90 00
Hatch fund,	—	—	15,000 00	15,000 00
Adams fund,	—	—	15,000 00	15,000 00
State fund,	—	—	20,000 00	25,000 00
Totals,	\$81,587 92	\$88,178 87	\$82,722 87	\$87,969 31
Balance beginning fiscal year,	—	—	7,151 90	8,286 85
Balance on hand at close of fiscal year,	8,286 85	8,077 29	—	—
	\$89,874 77	\$96,256 16	\$89,874 77	\$96,256 16

Analysis of Experiment Station Accounts.

	Adams Fund.	Fertilizer Law.	Feed Law.	Hatch Fund.	State Fund.	Totals.
Salaries,	\$14,527 47	\$6,617 92	\$3,880 42	\$12,674 25	\$11,998 02	\$49,698 08
Labor,	—	950 35	125 83	1,020 54	16,199 24	18,295 96
Publication,	—	706 58	520 38	—	368 55	1,595 51
Postage and stationery,	—	179 92	61 29	—	1,760 31	2,001 52
Freight and express,	—	35 91	4 05	—	391 26	431 22
Heat, light, water and power,	—	92 63	35 25	26 79	294 85	449 52
Chemistry and laboratory supplies,	—	438 16	181 23	682 52	1,488 78	2,790 69
Seeds, plants and sundry supplies,	—	44 85	20 16	392 09	2,142 64	2,599 74
Fertilizers,	—	46 71	—	46 25	323 40	416 36
Feeding stuffs,	—	—	—	7 20	900 69	907 89
Library,	—	11 50	5 00	16 92	942 57	975 99
Tools, machinery and appliances,	—	172 65	4 50	6 06	419 86	603 07
Furniture and fixtures,	—	62 10	16 86	—	469 51	548 47
Scientific apparatus and specimens,	—	79 56	9 09	16 88	935 00	1,040 53
Live stock,	—	—	—	—	77 66	77 66
Traveling expenses,	—	573 56	447 85	38 22	1,885 18	2,944 81
Contingent expenses,	—	—	5 00	—	109 50	114 50
Buildings and land,	—	34 61	20 63	—	1,454 55	1,509 79
Miscellaneous,	—	—	—	—	24 62	24 62
Equipment,	—	—	—	—	1,152 94	1,152 94
Totals,	\$14,527 47	\$10,047 01	\$5,337 54	\$14,927 72	\$43,339 13	\$88,178 87

EXPERIMENT STATION — *Concluded.**Summary.*

	Disbursements.	Receipts.
Cash on hand Dec. 1, 1914,	—	\$3,286 85
Receipts from State Treasurer,	—	31,000 00
Receipts from United States Treasurer,	—	30,000 00
Receipts from other sources,	—	26,969 31
Total disbursements,	\$88,178 87	—
Bills receivable Nov. 30, 1915,	\$88,178 87	\$96,256 16
Bills payable Nov. 30, 1915,	862 39	865 22
Balance,	8,080 12	—
	\$97,121 38	\$97,121 38

EXTENSION SERVICE.

Disbursements and Receipts.

ACCOUNTS.	Disbursements.	Receipts.	Apportionment.	Balance.
Administration,	\$2,015 04	\$62 92	\$3,050 00	\$1,097 88
Agricultural education,	2,132 94	3 23	2,250 00	120 29
Agricultural economics,	480 10	31 30	400 00	—48 80
Animal husbandry,	460 32	112 98	350 00	2 66
Auto demonstration outfit,	62 99	34 88	300 00	271 89
Apple packing school,	105 29	105 00	100 00	99 71
Assistant State leader,	640 62	—	760 00	119 38
Beekeeping,	80 22	—	200 00	119 78
Boys' camp,	974 77	837 45	200 00	62 68
Civic improvement,	814 12	410 45	500 00	96 33
Community service,	610 59	16 51	550 00	—44 08
Conference rural social workers,	503 43	—	500 00	—3 43
Correspondence courses,	1,035 95	655 67	200 00	—180 28
County agents,	279 95	—	200 00	—79 95
Dairying,	109 23	—	100 00	—9 23
Director's office,	1,193 18	29 05	1,300 00	135 87
Equipment,	1,413 80	—	2,100 00	686 20
Farm management,	439 13	262 03	100 00	—77 10
Farmers' week,	435 35	—	1,000 00	564 65
Home economics,	293 19	—	350 00	56 81
Hog cholera,	—	—	100 00	100 00
Itinerant instruction,	2,562 42	840 88	1,600 00	—121 54
Library extension,	44 46	1 80	200 00	157 34
M. A. C. Improvement Association,	—	—	100 00	100 00
Market gardening,	330 87	27 20	225 00	—78 67
Miscellaneous,	—	—	100 00	100 00
Pomology,	620 17	—	550 00	—70 17
Poultry convention,	310 69	—	300 00	—10 69
Poultry husbandry,	100 93	—	150 00	49 07
Salaries,	29,375 45	696 69	27,860 26	—818 50
Summer school,	4,111 05	910 56	2,500 00	—700 49
Ten weeks' school,	1,822 68	990 50	1,300 00	467 82
Tree warden school,	11 80	—	106 00	88 20
From State Treasurer,	—	50,000 00	—	—
Unapportioned balance,	—	—	—	9,456 11
Totals,	\$53,370 73	\$56,029 10	\$49,595 26	\$11,709 74
Balance beginning fiscal year Dec. 1, 1914,	—	9,051 37	—	—
Balance on hand Nov. 30, 1915,	11,709 74	—	—	—
	\$65,080 47	\$65,080 47	—	—

EXTENSION SERVICE — *Continued.**Summary.*

	Disbursements.	Receipts.
Balance Dec. 1, 1914,	—	\$10,486 86
Receipts Nov. 30, 1915,	—	6,029 10
Received from State Treasurer,	—	50,000 00
Received from United States Treasurer,	—	11,465 37
Disbursements to Nov. 30, 1915,	\$64,486 07	—
	\$64,486 07	\$77,981 33
Bills receivable Dec. 1, 1914, deducted,	—	899 26
Bills payable Dec. 1, 1914, deducted,	468 87	—
	\$64,017 20	\$77,082 07
Bills receivable Nov. 30, 1915,	—	152 00
Bills payable Nov. 30, 1915,	594 31	—
Balance,	12,622 56	—
	\$77,234 07	\$77,234 07

EXTENSION SERVICE — Concluded.
Analysis of Extension Service Disbursements.

	Travel.	Equipment.	Laboratory Expense.	Printing.	Supplies.	Instruction and Lectures.	Salaries.	Miscellaneous.	Totals.
Administration,	\$1,209 07	\$12 64	-	\$562 15	\$201 05	-	\$20,375 45	\$42 77	\$31,403 13
Agricultural education,	743 12	239 82	-	-	162 35	-	-	1,227 47	2,372 76
Agricultural economics,	447 39	32 02	-	-	32 71	-	-	-	512 12
Animal husbandry,	197 05	32 97	-	-	263 27	-	-	-	493 29
Animal husbandry,	61 70	35 00	-	-	-	-	-	1 29	97 99
Auto demonstration outfit,	22 50	72 79	-	-	-	-	-	10 00	105 29
Apple packing school,	600 79	1 31	-	-	39 83	-	-	-	641 93
Assistant State leader,	53 22	22 00	-	-	-	-	-	8 00	80 22
Beekeeping,	33 98	932 79	-	-	-	-	-	-	974 77
Boys' camp,	179 81	142 63	-	-	634 31	-	-	-	956 75
Civic improvement,	554 85	30 34	-	-	55 74	-	-	-	640 93
Community service,	234 69	-	-	-	-	-	-	268 74	503 43
Conference rural social workers,	136 07	114 70	-	-	634 05	-	-	265 83	1,150 05
Correspondence courses,	279 95	5 50	-	-	-	-	-	-	285 45
County agents,	101 73	67 63	-	-	7 50	-	-	176 86	176 86
Dairying,	242 78	243 80	-	-	1,016 23	-	-	-	1,436 98
Director's office,	17 16	129 19	-	-	196 35	-	-	-	568 32
Farm management,	197 19	-	-	-	418 19	-	-	-	435 35
Farmers' week,	381 12	110 55	-	-	96 00	-	-	-	403 74
Home economics,	-	48 92	-	-	577 55	-	-	-	2,611 34
Itinerant instruction,	-	106 32	-	-	-	-	-	1,603 75	1,603 75
Library extension,	307 30	-	-	-	23 57	-	-	44 46	330 87
Market gardening,	-	9 00	-	-	-	-	-	-	9 00
M. A. C. Improvement Association,	429 49	22 71	-	-	190 68	-	-	-	642 88
Pomology,	62 92	-	-	-	247 77	-	-	-	310 69
Poultry convention,	99 83	28 75	-	-	1 10	-	-	-	129 68
Poultry husbandry,	113 86	-	-	-	125 58	-	-	501 48	3,670 14
Summer School,	17 36	-	-	200 39	-	-	-	946 68	1,822 68
Ten weeks' school,	11 80	-	-	440 91	-	-	-	-	452 71
Tree warden's school,	-	-	-	-	-	-	-	-	-
Totals,	\$6,741 23	\$2,441 38	\$146 48	\$1,203 45	\$4,923 83	\$3,441 49	\$20,375 45	\$5,097 42	\$53,370 73

SMITH-LEVER FUND (FEDERAL).

	Disbursements.	Receipts.	Apportionment.	Balance.
Animal husbandry,	\$355 88	—	\$200 00	—\$155 88
Boys' and girls' club,	1,017 51	—	1,000 00	—17 51
Contingent,	34 60	—	145 35	110 75
Dairying,	154 62	—	200 00	45 38
Demonstration auto truck,	60 27	—	350 00	289 73
Farm management,	602 74	—	760 00	67 26
Home economics,	754 10	—	687 50	—66 60
Market gardening,	114 11	—	—	—114 11
Pomology,	218 82	—	200 00	—18 82
Poultry,	244 91	—	250 00	5 09
Publication,	627 26	—	500 00	—127 26
Salaries,	6,840 52	—	5,886 63	—953 89
County agents,	—	—	750 00	750 00
Extension schools,	—	—	291 67	291 67
From State Treasurer,	—	\$11,465 37	—	—
Totals,	\$11,115 34	\$11,465 37	\$11,221 15	\$105 81
Balance beginning fiscal year Dec. 1, 1914,	—	1,644 35	—	—
Balance on hand Nov. 30, 1915,	1,994 38	—	—	—
	\$13,109 72	\$13,109 72	—	—

SPECIAL APPROPRIATIONS.

	Date made.	Amount of Apportionment.	Amount previously expended.	Amount expended during Fiscal Year.	Amount expended to Date.	Amount received from State Treasurer.	Balance on Hand with State Treasurer.
Hospital,	1913	\$15,000 00	\$1,947 52	\$13,052 48	\$15,000 00	\$15,000 00	-
Sewers, ¹	1914	9,200 00	-	9,200 00	9,200 00	9,200 00	-
Agricultural building,	1914	210,000 00	16,194 75	176,629 92	192,824 67	192,824 67	\$17,175 33
Addition to power plant,	1915	10,000 00	-	10,000 00	10,000 00	10,000 00	-
Microbiology building,	1915	67,500 00	-	14,754 27	14,754 27	14,754 27	52,745 73
Totals, . . . . .	.	\$311,700 00	\$18,142 27	\$223,636 67	\$241,778 94	\$241,778 94	\$69,921 06

¹ In conjunction with town of Amherst for the Connecticut River outlet.

INVENTORY — REAL ESTATE.

Land (Estimated Value).

Baker place,	\$2,500 00
Bangs place,	2,350 00
Clark place,	4,500 00
College farm,	37,000 00
Cranberry land,	10,997 50
Harlow farm,	3,284 63
Kellogg farm,	5,868 45
Louisa Baker place,	5,000 00
Old creamery place,	1,000 00
Pelham quarry,	500 00
Westcott place,	2,250 00
Allen place,	500 00
Charmbury place,	450 00
Loomis place,	415 00
Hawley & Brown place,	675 00
Newell farm,	2,800 00
Owen farm,	5,000 00
Total,	\$85,090 58

College Buildings (Estimated Value).

	Inventory at Beginning of Year.	Per Cent.	Value at Beginning of Year less Per Cent. Deterioration.	Repairs and Improve- ments during Year.	Total Value.
Apiary,	\$3,000 00	2	\$2,940 00	\$102 08	\$3,042 08
Animal husbandry building,	10,000 00	2	9,800 00	25 50	9,825 50
Chemical laboratory,	8,000 00	5	7,600 00	135 90	7,735 90
Clark hall,	67,500 00	2	66,150 00	309 04	66,459 04
Cold-storage laboratory,	12,000 00	2	11,760 00	91 09	11,851 09
Dairy building,	75,000 00	2	73,500 00	724 17	74,224 17
Dairy barn and storage,	30,000 00	3	29,100 00	80 06	29,180 06
Dining hall,	60,000 00	3	58,200 00	503 87	58,703 87
Drill hall and gun shed,	10,000 00	5	9,500 00	140 28	9,640 28
Durfee glass houses, old,	10,000 00	5	9,500 00	48 50	9,548 50
Durfee glass houses, new,	15,000 00	5	14,250 00	326 72	14,576 72
Entomology building,	80,000 00	2	78,400 00	373 17	78,773 17
Farm bungalow,	2,100 00	3	2,037 00	9 63	2,046 63
Farmhouse,	2,500 00	3	2,425 00	57 07	2,482 07
French hall,	50,000 00	2	49,000 00	710 76	49,710 76
Horse barn,	5,000 00	3	4,850 00	25 71	4,875 71
Horticultural barn,	2,500 00	3	2,425 00	72 83	2,497 83
Horticultural tool shed,	2,000 00	3	1,940 00	—	1,940 00
Hospital,	—	—	15,000 00	452 28	15,452 28
Machinery barn,	4,000 00	3	3,880 00	5 07	3,885 07
Mathematical building,	6,000 00	5	5,700 00	51 14	5,751 14
North dormitory,	25,000 00	2	24,500 00	304 44	24,804 44
Physics laboratory,	5,500 00	5	5,225 00	114 06	5,339 06
Piggery,	3,000 00	3	2,910 00	10 47	2,920 47
Poultry department:—					
Breeding houses,	1,600 00	2	1,568 00	—	1,568 00
Brooder house,	1,000 00	2	980 00	103 55	1,083 55
Incubator cellar and building,	1,400 00	2	1,372 00	—	1,372 00
Incubator cellar and storage build- ing,	—	—	800 00	—	800 00
Crematory,	—	—	50 00	—	50 00

College Buildings (Estimated Value) — Concluded.

	Inventory at Beginning of Year.	Per Cent.	Value at Beginning of Year less Per Cent. De- terioration.	Repairs and Improve- ments during Year.	Total Value.
<i>Poultry department — concluded.</i>					
Duck house,	—	—	\$100 00	—	\$100 00
Laboratory,	\$1,300 00	2	1,274 00	\$71 51	1,345 51
Laying house,	1,800 00	2	1,764 00	—	1,764 00
Mechanics and storage building,	1,900 00	2	1,862 00	32 67	1,894 67
Power plant and storage building,	18,500 00	2	18,130 00	12,742 28	30,872 28
President's house,	12,000 00	3	11,640 00	241 21	11,881 21
Quarantine barn,	200 00	3	194 00	—	194 00
Rural engineering building,	—	—	3,550 00	—	3,550 00
Sheep barn,	1,400 00	3	1,358 00	57 66	1,415 66
South dormitory,	35,000 00	2	34,300 00	948 44	35,248 44
Stockbridge hall,	—	—	184,000 00	—	184,000 00
Agromony greenhouse,	—	—	2,150 00	—	2,150 00
Stone chapel,	30,000 00	2	29,400 00	110 58	29,510 58
Three houses on Stockbridge road,	5,000 00	5	4,750 00	425 10	5,175 10
Vegetable plant house,	4,700 00	5	4,465 00	128 31	4,593 31
Veterinary laboratory and stable,	23,500 00	2	23,030 00	97 39	23,127 39
Waiting station,	500 00	2	490 00	5 80	495 80
Wilder hall,	37,500 00	2	36,750 00	62 29	36,812 29
Young stock barn,	6,500 00	3	6,305 00	114 50	6,419 50
Totals,	\$671,900 00	—	\$860,874 00	\$19,815 13	\$880,689 13

College Equipment (Estimated Value).

<i>Administrative division: —</i>					
Dean's office,					\$502 11
President's office,					1,250 60
Registrar's office,					909 00
Treasurer's office,					2,458 41
<i>Agricultural division: —</i>					
Agromony,					6,213 52
Animal husbandry,					857 48
Dairy,					13,612 92
Farm administration,					882 56
Farm department,					39,291 63
Poultry,					4,195 47
Rural engineering,					2,159 81
Dining hall,					6,279 37
Extension,					10,311 41
<i>General science: —</i>					
Apiary,					1,482 07
Botanical,					10,133 21
Chemical,					12,844 55
Entomology,					6,715 71
Microbiology,					5,805 00
Mathematics,					2,431 00
Physics,					4,463 02
Veterinary,					9,843 18
Zoölogical laboratory,					10,023 55
Zoölogical museum,					6,511 05
Graduate school,					70 76

Horticultural division:—

Floriculture,	\$8,559 12
Forestry,	2,598 63
General horticulture,	7,606 22
Grounds,	793 93
Landscape gardening,	5,113 78
Market gardening,	1,320 03
Pomology,	5,008 34

Hospital,	815 22
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Humanities, division of:—

Economics and sociology,	107 87
Language and literature,	396 73

Library,	83,700 85
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Military,	1,485 42
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Operating and maintenance:—

College supply,	794 16
Fire apparatus,	1,859 15
General maintenance,	89,846 57
Equipment,	\$78,326 85
Carpentry and masonry supplies,	3,703 17
Electrical supplies,	1,131 33
Heating and plumbing supplies,	5,744 84
Painting supplies,	940 38

Janitors' supplies,	410 46
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Sewer line,	12,103 00
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Water mains,	10,924 81
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Physical education,	2,737 98
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Rural social science:—

Agricultural economics,	385 50
Agricultural education,	835 59
Rural sociology,	240 33

Textbooks,	401 15
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Trophy room,	1,647 10
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Total,	\$398,939 33
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Experiment Station Buildings (Estimated Value).

	Inventory at Beginning of Year.	Per Cent.	Cost at Beginning of Year less Per Cent. Deterioration.	Repairs and Improve- ments.	Total Value.
Agricultural laboratory,	\$15,000 00	2	\$14,700 00	\$462 51	\$15,162 51
Agricultural barns,	5,000 00	3	4,850 00	32 27	4,882 27
Agricultural farmhouse,	1,500 00	3	1,455 00	—	1,455 00
Agricultural glass house,	500 00	5	475 00	—	475 00
Cranberry buildings,	2,800 00	—	2,645 00	—	2,645 00
Plant and animal chemistry laboratory,	30,000 00	2	29,400 00	112 13	29,512 13
Plant and animal chemistry barns,	4,000 00	3	3,880 00	119 28	3,999 28
Plant and animal chemistry dairy,	2,000 00	3	1,940 00	—	1,940 00
Six poultry houses,	600 00	2	588 00	—	588 00
Entomological glass houses,	825 00	5	783 75	—	783 75
Totals,	\$62,225 00	—	\$60,716 75	\$726 19	\$61,442 94

Experiment Station Equipment (Estimated Value).

Agricultural laboratory,	\$6,815 61
Botanica laboratory,	6,450 65
Chemical laboratory,	17,504 59
Cranberry station,	2,863 64
Director's office,	4,584 34
Entomological laboratory,	24,134 42
Horticultural laboratory,	2,245 00
Meteorology laboratory,	928 00
Microbiology laboratory,	340 00
Poultry department,	3,807 16
Treasurer's office,	1,106 50
Veterinary laboratory,	65 00
Total,	<hr/> \$70,844 91

Inventory Summary.

Land,	\$85,090 58
College buildings,	880,689 13
College equipment,	398,939 33
Experiment station buildings,	61,442 94
Experiment station equipment,	70,844 91
Total,	<hr/> \$1,497,006 89

STUDENTS' TRUST FUND ACCOUNT.

	Disburse- ments for Year ending Nov. 30, 1915.	Receipts for Year ending Nov. 30, 1915.	Balance on Hand.	Balance brought for- ward Dec. 1, 1914.
Athletics,	\$9,357 65	\$10,910 29	\$2,341 91	\$789 27
College signal,	1,510 48	1,278 20	8 73	241 01
Dining hall,	56,589 75	50,839 32	—6,115 80	—365 37
Keys,	79 25	56 00	45 00	68 25
Students' deposits,	12,150 88	17,571 47	7,141 47	1,720 88
Social union,	493 96	698 35	699 60	495 22
Textbooks,	4,762 73	4,967 07	936 39	732 05
Athletic field,	3,704 13	2,515 46	—1,197 16	—8 49
Uniforms,	3,352 35	3,635 80	3,308 69	3,025 24
1913 index,	14 84	7 42	—	7 42
1915 index,	438 73	429 95	—	8 78
1916 index,	1,526 93	1,532 62	5 76	07
Totals,	\$93,981 68	\$94,441 95	\$7,174 59	\$6,714 33
Balance on hand Dec. 1, 1914,	—	6,714 32	—	—
Balance on hand Nov. 30, 1915,	7,174 59	—	—	—
	\$101,156 27	\$101,156 27	—	—

DETAILED STATEMENT OF DINING HALL.

	Liabilities.	Resources.
1914.		
Dec. 1. Balance,	\$343 49	—
1915.		
Nov. 30. Total disbursements,	56,589 75	—
Outstanding bills,	1,033 49	—
Total collections,	—	\$50,839 32
Accounts outstanding,	—	1,571 54
Inventory,	—	3,449 77
Balance,	—	2,106 10
	\$57,966 73	\$57,966 73

ENDOWMENT FUND.¹

	Principal.	Income.
United States grant (5 per cent.),	\$219,000 00	\$7,300 00
Commonwealth grant (3½ per cent.),	142,000 00	3,313 32
	—	\$10,613 32

¹ This fund is in the hands of the State Treasurer, and the Massachusetts Agricultural College receives two-thirds of the income from the same.

BURNHAM EMERGENCY FUND.

	Market Value Dec. 1, 1915.	Par Value.	Income.
Two bonds American Telephone and Telegraph Company 4s, at \$910,	\$1,820 00	\$2,000 00	\$80 00
Two bonds Western Electric Company 5s, at \$1,000,	2,000 00	2,000 00	100 00
	\$3,820 00	\$4,000 00	\$180 00
Unexpended balance, Dec. 1, 1914,	-	-	140 55
Cash on hand Nov. 30, 1915,	-	-	\$320 55

LIBRARY FUND.

Five bonds New York Central & Hudson River Railroad Company 4s, at \$930,	\$4,650 00	\$5,000 00	\$200 00
Five bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$950,	4,750 00	5,000 00	200 00
Two shares New York Central & Hudson River Railroad Company stock, at \$102,	204 00	200 00	10 00
Amherst Savings Bank, deposit,	167 77	167 77	7 09
	\$9,771 77	\$10,367 77	\$417 09
Nov. 20, 1915, transferred to college library account,	-	-	417 09

SPECIAL FUNDS.

Endowed Labor Fund (the Gift of a Friend of the College).

Two bonds American Telephone and Telegraph Company 4s, at \$910,	\$1,820 00	\$2,000 00	\$80 00
Two bonds, Lake Shore & Michigan Southern Railroad Company 4s, at \$950,	1,900 00	2,000 00	80 00
One bond New York Central Railroad debenture 4s,	930 00	1,000 00	40 00
Amherst Savings Bank Deposit,	143 39	143 39	6 07
One bond Metropolitan Street Railway of Kansas City 5s,	950 00	1,000 00	-
	\$5,743 39	\$6,143 39	\$206 07
Unexpended balance Dec. 1, 1914,	-	-	1,024 90
	-	-	\$1,230 97
Disbursements for fiscal year ending Nov. 30, 1915,	-	-	1,000 00
Cash on hand Nov. 30, 1915,	-	-	\$230 97

Whiting Street Scholarship Fund.

One bond New York Central debenture 4s,	\$930 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit,	271 64	271 64	11 51
	\$1,201 64	\$1,271 64	\$51 51
Unexpended balance Dec. 1, 1914,	-	-	136 16
Cash on hand Nov. 30, 1915,	-	-	\$187 67

SPECIAL FUNDS — *Continued.**Hills Fund.*

	Market Value Dec. 1, 1915.	Par Value.	Income.
One bond American Telephone and Telegraph Company 4s, at	\$910 00	\$1,000 00	\$40 00
One bond New York Central & Hudson River Railroad debenture 4s, at	930 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad debenture 3½s, at	870 00	1,000 00	35 00
Two bonds Metropolitan Street Railway of Kansas City 5s, at \$950,	1,900 00	2,000 00	—
Three bonds Pacific Telephone and Telegraph Company 5s, at \$990,	2,970 00	3,000 00	150 00
One bond Western Electric Company 5s, at	1,000 00	1,000 00	50 00
Boston & Albany Railroad stocks, 3⅞ shares, at \$187,	677 88	362 50	31 68
Amherst Savings Bank, deposit,	72 75	72 75	3 06
Electric Securities Company bonds, 1½%, at \$1,000,	1,121 00	1,180 00	59 00
	\$10,451 63	\$10,615 25	\$408 74
Unexpended balance Dec. 1, 1914,	—	—	1,025 88
	—	—	\$1,434 62
Disbursements for fiscal year ending Nov. 30, 1915,	—	—	534 85
Cash on hand Nov. 30, 1915,	—	—	\$899 77

Mary Robinson Fund.

Amherst Savings Bank,	\$142 00	\$142 00	\$1 42
Boston & Albany Railroad stock, ⅜ share, at \$187,	70 13	38 00	3 32
Electric Securities Company bonds, 4½% share, at \$1,000,	779 00	\$20 00	41 00
	\$991 13	\$1,000 00	\$45 74
Unexpended balance Dec. 1, 1914,	—	—	155 89
	—	—	\$201 63
Investment of fund for fiscal year ending Nov. 30, 1915,	—	—	142 00
Cash on hand Nov. 30, 1915,	—	—	\$59 63

Grinnell Prize Fund.

Ten shares New York Central & Hudson River Railroad stock, at \$102,	\$1,020 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1914,	—	—	195 74
	\$1,020 00	\$1,000 00	\$245 74
Disbursements for prizes,	—	—	50 00
Cash on hand Nov. 30, 1915,	—	—	\$195 74

Gassett Scholarship Fund.

One bond New York Central & Hudson River Railroad debenture 4s,	\$930 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit,	11 64	11 64	46
	\$941 64	\$1,011 64	\$40 46
Unexpended balance Dec. 1, 1914,	—	—	101 85
Cash on hand Nov. 30, 1915,	—	—	\$142 31

SPECIAL FUNDS — *Concluded.**Massachusetts Agricultural College (Investment).*

	Market Value Dec. 1, 1915.	Par Value.	Income.
One share New York Central & Hudson River Railroad stock,	\$102 00	\$100 00	\$5 00
Unexpended balance Dec. 1, 1914,	—	—	70 45
Cash on hand Nov. 30, 1915,	—	—	\$75 45

Danforth Keyes Bangs Fund.

Two bonds Pacific Telephone and Telegraph Company 5s, at \$990,	\$1,980 00	\$2,000 00	\$100 00
Two bonds Union Electric Light and Power Company 5s, at \$980,	1,960 00	2,000 00	100 00
Two bonds American Telephone and Telegraph Company 4s, at \$910,	1,820 00	2,000 00	80 00
Interest from student loans,	—	—	35 41
	\$5,760 00	\$6,000 00	\$315 41
Unexpended balance Dec. 1, 1914,	—	—	381 21
	—	—	\$696 62
Total loans made to students during fiscal year, \$1,503 00			
Cash received on account of student loans,	1,478 00		
Excess of loans made, over accounts paid by students,			25 00
Cash on hand Nov. 30, 1915,			\$671 62

John C. Cutter Fund.

One bond Pacific Telephone and Telegraph Company 5s,	\$990 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1914,	—	—	30 25
	\$990 00	\$1,000 00	\$80 25
Disbursements for fiscal year to date,	—	—	32 41
Cash on hand Nov. 30, 1915,	—	—	\$47 84

William R. Sessions Fund.

One bond New York Central & Hudson River Railroad stock 6s,	\$555 00	\$500 00	\$15 00
Amherst Savings Bank, deposit,	2,500 00	2,500 00	—
	\$3,055 00	\$3,000 00	—
Cash on hand Nov. 30, 1915,	—	—	\$15 00

Alvord Dairy Scholarship Fund.

Amherst Savings Bank, deposit,	\$4,000 00	\$4,000 00	—
Overdraft Nov. 30, 1915, ¹	—	—	\$600 00
	\$4,000 00	\$4,000 00	\$600 00

¹ Expense incurred in securing fund.

SUMMARY OF BALANCES ON HAND OF THE INCOME FROM FUNDS HELD IN
TRUST BY THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Burnham emergency,	\$320 55
Endowed labor fund,	230 97
Whiting Street scholarship fund,	187 67
Hills fund,	899 77
Mary Robinson fund,	59 63
Grinnell prize fund,	195 74
Gassett scholarship fund,	142 31
Massachusetts Agricultural College investment fund,	75 45
Danforth Keyes Bangs fund,	671 62
John C. Cutter fund,	47 84
Wm. R. Sessions fund,	15 00
	<hr/>
	\$2,841 55
Alvord dairy scholarship fund overdraft,	600 00
	<hr/>
	\$2,241 55

I hereby certify that I have this day examined the Massachusetts Agricultural College account, as reported by the treasurer, Fred C. Kenney, for the year ending Nov. 30, 1915. All bonds and investments are as represented in the treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

CHARLES A. GLEASON,
Auditor.

DEC. 8, 1915.

HISTORY OF SPECIAL FUNDS.

Burnham emergency fund: —

A bequest of \$5,000 from T. O. H. P. Burnham of Boston, made without any conditions. The trustees of the college directed that \$1,000 of this fund should be used in the purchase of the Newell land and Goessmann library.

The fund now shows an investment of \$4,000 00

Library fund: —

The library of the college at the present time contains about 48,411 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. Dec. 27, 1883, William Knowlton gave \$2,000; Jan. 1, 1894, Charles L. Flint gave \$1,000; in 1887, Elizur Smith of Lee, Mass., gave \$1,215. These were the largest bequests, and now amount to 10,000 00

Endowed labor fund: —

Gift of a friend of the college in 1901, income of which is to be used for the assistance of needy and deserving students, 5,000 00

Whiting Street scholarship: —

Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used. This fund is now used exclusively for scholarship, . . . \$1,000 00

Hills fund: —

Gift of Leonard M. and Henry F. Hills of Amherst, Mass., in 1867, to establish and maintain a botanic garden, 10,000 00

Mary Robinson fund: —

Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, . . . 1,000 00

Grinnell prize fund: —

Gift of Hon. Wm. Claflin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, . . . 1,000 00

Gassett scholarship fund: —

Gift of Henry Gassett of Boston, the income to be used for scholarship, . . . 1,000 00

Massachusetts Agricultural College investment fund: —

Investment made by vote of trustees in 1893 to purchase one share of New York Central & Hudson River Railroad stock. The income from this fund has been allowed to accumulate, . . . 100 00

Danforth Keyes Bangs fund: —

Gift of Louisa A. Baker of Amherst, Mass., April 14, 1909, the income thereof to be used annually in aiding poor, industrious and deserving students to obtain an education in said college, . . . 6,000 00

John C. Cutter fund: —

Gift of Dr. John C. Cutter of Worcester, Mass., an alumnus of the college, who died in August, 1909, to be invested by the trustees, and the income to be annually used for the purchase of books on hygiene, . . . 1,000 00

Alvord dairy scholarship fund: —

Gift of Henry E. Alvord, who was the first instructor in military tactics, 1869-71, and a professor of agriculture, 1885-87, at this institution. The income of this fund is to be applied to the support of any worthy student of said college, graduate or post-graduate, who may be making a specialty of the study of dairy husbandry (broadly considered), with the intention of becoming an investigator, teacher or special practitioner in connection with the dairy industry, provided that no benefits arising from such fund shall at any time be applied to any person who then uses tobacco in any form or fermented or spirituous beverages, or is known to have done so within one year next preceding, . . . 4,000 00

William R. Sessions fund: —

In accordance with the request of my deceased wife, Clara Markham Sessions, made in her last will, I bequeath to the trustees of the Massachusetts Agricultural College, Amherst, Mass., the sum of \$5,000, it being the amount received by me from the estate of the said Clara Markham Sessions. The said \$5,000 to be kept by the said trustees a perpetual fund, the income from which shall be for the use of the Massachusetts Agricultural College; and according to the further request of my deceased wife, made in her last will, this is to be known as the William R. Sessions fund, and is to be a memorial of William R. Sessions; and it is my special request that the said trustees shall make record of the fact that this fund came from the estate of my deceased wife, Clara Markham Sessions, in accordance with her request made in her last will, \$5,000 00

\$49,100 00

PRIZES.

Animal husbandry. The F. Lothrop Ames prize, given by F. Lothrop Ames, Langwater Farms, North Easton, Mass., consisting of \$150 a year, offered for a period of five years, to be given to the three students standing highest in the work of advanced live stock judging, and to be used in defraying their expenses incurred by participation in the students' judging contest at the National Dairy Show, Chicago. Given in May, 1912, available first in autumn of 1912, and for the four succeeding years, \$150 00

FRED C. KENNEY,
Treasurer.

In Memoriam.

WILLIAM H. BOWKER.

Mr. William H. Bowker of the Board of Trustees died in Boston, Jan. 4, 1916. The trustees, in passing memorial resolutions, expressed the wish to have them incorporated in the report of the president and other officers for the fiscal year 1915. The memorial is as follows:—

Tribute adopted by the Trustees of Massachusetts Agricultural College, at Boston, Jan. 7, 1916.

Our associate William Henry Bowker, senior member of this Board in years of service, died at his home in Boston three days ago.

Born July 3, 1850, at Natick, and taught in the public schools of Philipston and Templeton, he was a member of the first, the "pioneer," class of students received at the Massachusetts Agricultural College Oct. 2, 1867, and was graduated there July 19, 1871.

After about two years given to teaching and newspaper work, he founded, on new and untried lines, the business that by various stages grew into the large, successful and dominant work of his life,—the making and merchandizing of fertilizers and allied products. In the technical and commercial aspects of that business he became an acknowledged authority.

He set up for himself and his associates high standards of honor and accountability, and was a potent factor in promoting, through legislative regulation and otherwise, the policy and practice of the *open hand* in dealings between manufacturer and consumer.

Always from his student days an ardent friend of the college, and perhaps the most resourceful and effective worker and leader in its behalf among its alumni, he became in January, 1885, a member of this Board, *as the first one appointed by the Governor* of the Commonwealth, under legislation that sprang from his own early suggestion and efforts to reform the tenure of its membership and terminate its own self-elective functions.

He was conservative by family heritage and home influence, democratic, large-hearted, a lover of manly men and popular among his fellows. His mental traits, ripened through wide and intimate contact with men and affairs and by much reading and travel, were marked by breadth of view, originality of ideas and independence of thought, which, with a natural aptness of expression and power of effective statement, made him interesting in conversation and discourse and forcible in controversy.

With intimates his speech was well-nigh as frank and free as his thought; often leavened with humor, always (when in health) with good nature; and if in discussing real issues to be faced and placed he sometimes urged his view or criticised an opposing one with an apparent excess of ardor, it was due, not to lack of human kindness and sympathy in his make up, but rather to keen interest, ample courage and faith in his cause. Withal, he was equally ready to concede points scored by an opponent, and left no sting in the hearts of those with whom he differed.

He has now laid down in honor and loyalty, at the feet of his alma mater and of the Commonwealth, the burden and the harvest that go with high privilege and duty done, after the longest term of service given by any present or former member of this Board; and was himself conspicuous in making that period the richest and most fruitful in the history of the college he loved so well.

THE PERSONAL WORD.

I often feel that in this institution the relation between the president and the trustees is almost ideal. Mr. Bowker, because of his forceful personality, his fertility in ideas, his quick appreciation of situations, his breadth of view, his long connection with the institution in various capacities, and his continued membership on trustee committees that dealt with important policies, was a wise, helpful and sympathetic counselor. I went to him frequently. It is difficult to express with restraint the obligation that I owe him, both officially and personally. I know that by all of us, trustees and faculty, his loss will be keenly felt, not only because of the choice personal element that entered into all our counsels, but because of the value of his contribution to our common work.

KENYON L. BUTTERFIELD.



The Massachusetts Agricultural College

SHORT COURSES

SUMMER SCHOOLS
1916



AMHERST, MASSACHUSETTS

"THE AMHERST MOVEMENT"

**THE MASSACHUSETTS AGRICULTURAL COLLEGE
SUMMER SCHOOLS
1916**

The Summer School of Agriculture and Country Life

July 3—July 28

(See Page 7)

Schools for Rural Social Service

July 12—July 18 Inc.

(See Page 24)

School for Rural and Village Teachers

School for Organization of Work for Girls and Women

School for Rural Clergymen



Agricultural Camps

(See Page 26)

First Boys' Camp July 3—July 11

Second Boys' Camp July 12—July 20

Third Boys' Camp for Prize Winners July 21—July 29

Girls' Camp for Prize Winners July 21—July 29

The Poultry Convention

July 19—21 Inclusive

(See Page 29)

Conference on Rural Organization

Postponed until October—Program ready, September 1, 1916

(See Page 29)

"THE AMHERST MOVEMENT"

FACULTY OF THE SUMMER SCHOOLS

1916

KENYON L. BUTTERFIELD, A. M., LL. D.

President of the College

WILLIAM D. HURD, M. AGR.

Director of The Extension Service and Supervisor of Short Courses.

CHARLES R. GREEN, B. AGR.

Librarian of the College

F. JOSEPHINE HALL, A. M.

Adviser for Women

JOHN L. BYARD

Superintendent of Apiary.

Beekeeping

ALEXANDER E. CANCE

Professor of Agricultural Economics.

Agricultural Economics

WALTER W. CHENOWETH, M. SC.

Associate Professor of Pomology.

Pomology

WILLIAM D. CLARK, A. B., M. F.

Professor of Forestry.

Forestry

LAURA COMSTOCK

Extension Professor of Home Economics.

Home Economics

SAMUEL COONS

Instructor in Dairying.

Dairying

E. FARNHAM DAMON, B. SC.

Extension Associate Professor of Agricultural Economics.

Agricultural Economics

HENRY T. FERNALD, PH.D.

Professor of Entomology.

Entomology

JAMES A. FOORD, M.SC.AGR.

Professor of Farm Administration.

Farm Administration

BURTON N. GATES, PH.D.

Associate Professor of Beekeeping.

Beekeeping

HELENA T. GOESSMANN, M.PH.

Instructor in English.

Library School

HAROLD M. GORE, B.SC.

Assistant in Physical Education.

Boys' Camps

JOHN C. GRAHAM, B.SC.

Professor of Poultry Husbandry.

Poultry Husbandry

ERNST HERMANN

Director of Playground Association, Newton, Mass.

Organized Play

"THE AMHERST MOVEMENT"

FACULTY OF THE SUMMER SCHOOLS—Continued

IDA E. HALL, LL.B. Waltham, Mass.	<i>Plays and Pageants</i>
EARL JONES, M.Sc. Assistant Professor of Agronomy.	<i>Soil Fertility</i>
HARRY HIGGINBOTHAM M. A. C., 1917, Student Assistant.	
WILLIAM P. B. LOCKWOOD, M.Sc. Professor of Dairying.	<i>Dairying</i>
FREDERICK A. McLAUGHLIN, B.Sc. Instructor in Botany.	<i>Botany</i>
JOHN C. McNUTT, B.Sc.AGR. Professor of Animal Husbandry.	<i>Animal Husbandry</i>
CHARLES J. MAYNARD Naturalist and Lecturer, West Newton, Mass.	<i>Ornithology</i>
ORION A. MORTON Extension Professor of Agricultural Education.	<i>Boys' and Girls' Clubs</i>
EZRA L. MORGAN, A.M. Extension Professor of Community Planning.	<i>Community Planning</i>
ETHEL H. NASH Extension Instructor in Agricultural Education.	<i>Boys' and Girls' Clubs</i>
ARNO H. NEHRLING Associate Professor of Floriculture.	<i>Floriculture</i>
A. VINCENT OSMUN, M.Sc. Associate Professor of Botany.	<i>Botany</i>
SAMUEL R. PARSONS, B.Sc. Instructor, Pennsylvania State College.	<i>Boys' Camps</i>
CHARLES A. PETERS, Ph.D. Associate Professor of Inorganic and Soil Chemistry.	<i>Chemistry</i>
FREDERICK W. RIED Director of Practical Arts, Framingham (Mass.) Normal School.	<i>Handicrafts</i>
MARIE SAYLES, B.S. Extension Instructor in Home Economics.	<i>Home Economics</i>
F. A. CUSHING SMITH, B.Sc., M.L.A. Extension Instructor in Civic Improvement.	<i>Civic Improvement</i>
LEONE E. SMITH, B.Sc. Superintendent Colchester (Conn.) Boys' Club.	<i>Boys' Camps</i>
FRANK A. WAUGH, M.Sc. Professor of Landscape Gardening.	<i>Landscape Gardening</i>
WILLARD E. WATERBURY Field Secretary, Massachusetts Baptist Missionary Society, Boston.	<i>Rural Church</i>

"THE AMHERST MOVEMENT"

COMMITTEES OF THE FACULTY OF THE SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

Course of Study

PROFESSORS PETERS, GRAHAM, FERNALD, HURD

Excursions

PROFESSORS OSMUN, WAUGH, HURD

Social Evenings

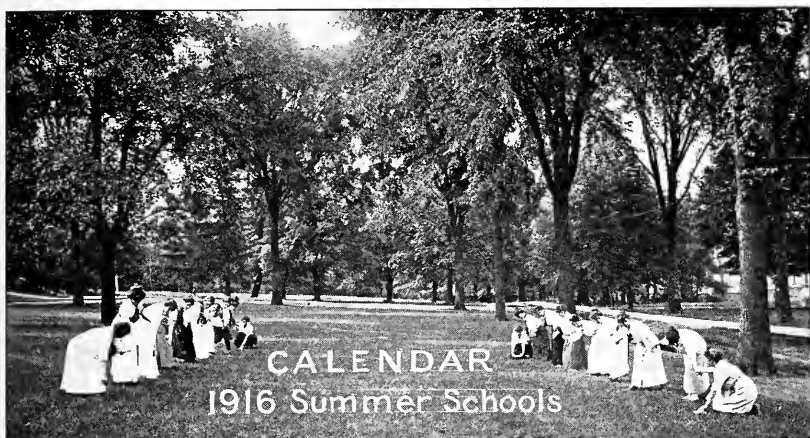
PROFESSORS SEARS, HART, RIED, HURD, MISS F. JOSEPHINE HALL

Athletics and Recreation

PROFESSORS LOCKWOOD, MORGAN, HURD.

So far as possible, the members of the faculty of the Summer Schools are selected from the regular faculty of the College. Where instructors are engaged from other institutions, great care is taken to secure men and women eminent in their respective lines of work.





- Monday, July 3.** Registration and assignment of rooms for Summer School of Agriculture and Country Life.
First Boys' Camp begins.
- July 4.** Amherst Community Fourth of July Celebration.
Summer School participates in the program.
- July 5.** Classes begin.
Afternoon excursion: to "The Orient."
7:30 Informal out-door reception to Summer School Students.
- July 6.** Afternoon, 3:00-5:00, Organized Play and Recreation.
Evening, 8:00, Lecture; Major General Leonard Wood, Governors Island, N. Y.
- July 7.** 3:00 P. M., Seminar; The State and Nation-Wide Extension Work Movement. Leader, Director William D. Hurd.
Afternoon class excursions.
8:00—11:00 P. M., Social Evening, Drill Hall.
- July 8.** Morning, regular Summer School classes.
Afternoon excursion: to Mt. Sugar Loaf; Sports and Basket Supper.
- Monday, July 10.** 3:00 P. M., Seminar; The Cooperative Organization Movement in Agriculture. Leader, Professor A. E. Cance.
Afternoon class excursions.
- July 11.** First Boys' Camp ends.
Registration for Schools for Rural Social Service.
Afternoon, 3:00—5:00, Organized Play and Recreation.
8:00—10:00 P. M., Social Evening, Drill Hall.
- July 12.** Second Boys' Camp begins.

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- Schools for Rural Social Service begin. Separate Schools for Rural and Village Teachers, Women and Girl Workers, and Rural Clergymen.
- Afternoon excursion: to Mount Holyoke College, the Paper Mills and Mount Tom.
- July 13.** Afternoon, 3:00—5:00, Organized Play and Recreation.
- Evening, 8:00. Lecture. (To be announced.)
- July 14.** 3:00 P. M., Seminar; The Country Life Movement. Leader, President Kenyon L. Butterfield.
- Afternoon class excursions.
- 8:00—11:00 P. M., Social Evening, Drill Hall.
- July 15.** Morning, regular Summer School classes.
- Afternoon excursion; (Place to be announced.)
- Monday, July 17.** 3:00 P. M., Seminar; Community Planning. Leader, Professor E. L. Morgan.
- Afternoon class excursions.
- July 18.** Schools for Rural Social Service end.
- 3:00—5:00 P. M., Organized Play and Recreation.
- 8:00—10:00 P. M., Social Evening, Drill Hall.
- July 19.** Poultry Convention begins.
- Afternoon excursion; the Holyoke Range and Prospect House, Mt. Holyoke.
- July 20.** Second Boys' Camp ends.
- Poultry Convention.
- 3:00—5:00 P. M., organized play.
- 8:00 P. M., Outdoor Performance, A Shakespearean production.
- July 21.** Boys' Camp for prize winners begins.
- Girls' Camp for prize winners begins.
- Poultry Convention ends.
- Afternoon class excursions.
- 3:00 P. M., Seminar; Boys' and Girls' Club Work. Leader, Professor O. A. Morton.
- 8:00—11:00 P. M., Joint Social Evening, Summer School and Graduate School.
- July 22.** All day excursion; to "Old Deerfield."
- Monday, July 24.** 3:00 P. M., Seminar; Town Planning and Civic Improvement. Leader, Professor F. A. Waugh.
- July 25.** 8:00—10:00 P. M., Social Evening, Drill Hall.
- July 26.** Afternoon excursion; to Northampton, Smith College and the Silk Mills.
- July 27.** Evening, 8:00, Lecture.
- July 28.** Summer School of Agriculture and Country Life ends.
- July 29.** Boys' and Girls' Camps for prize winners end.

SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

ANNOUNCEMENT



THE Summer School of Agriculture and Country Life of the Massachusetts Agricultural College will open July 3, for a term of four weeks, closing July 28. This will be the ninth session of the Summer School. The experience of the past eight years will aid in making material improvements in the session of 1916. The work of the Summer School was designed originally for school teachers, and the attendance has been largely of that class. Special attention

will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture who can come to the college conveniently during the summer season. Practical courses will be offered for the benefit of such persons also. The courses offered for the current year may be grouped as follows:

1. Courses in practical agriculture and horticulture.
2. Courses in elementary sciences bearing on agriculture and horticulture.
3. Courses in agricultural education.
4. Courses in agricultural economics and rural sociology.
5. Courses in play and recreation.
6. Courses in domestic economy and household science.
7. Courses arranged especially for rural and village school teachers.
8. Courses for workers with girls and women.
9. Courses for rural ministers.

From these courses it will be possible to make up programs of work especially suitable to the needs of school teachers, principals, superintendents, school committeemen, farm owners, suburban residents, clergymen, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses will best suit their needs should correspond with the Supervisor of Short Courses, who will gladly advise in all such matters.

"THE AMHERST MOVEMENT"

COURSES

GROUP A

GENERAL AGRICULTURE, ANIMAL HUSBANDRY, DAIRYING

1. Soil Fertility.

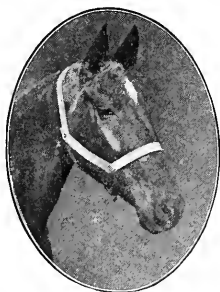
Professor Jones

A systematic study of the factors governing crop production. This course includes a field study of soils of different formations and different textures; a study of tillage, tillage methods, and tillage implements; a study of soil fertility as affected by crop rotations and green manures; and of the economical use of manures, lime and commercial fertilizer. A large part of the work consists of field exercises. Five exercises a week; four weeks.

2. Breeds and Types of Live Stock.

Professor McNutt

As detailed a study as is possible of the different breeds and types of farm animals. The characteristics of draft, coach, roadster and saddle horses are studied with a brief review of the several breeds adapted to each class. The history, characteristics and adaptations of the leading dairy and beef breeds of cattle are discussed. Feeding, especially of dairy cattle for economic milk production and care and management consistent with the successful growing of live stock, receive attention. Time is given to the judging of horses and dairy cattle. The work is made practical throughout. Five exercises a week; four weeks.



3. Modern Dairying.

Professor Lockwood

This course is designed to give an idea of modern dairying. It is practical rather than theoretical, and covers briefly; composition and secretion of milk; principles and methods of creaming; abnormal milk and causes; proper handling of milk and cream on the farm; value of milk as food; relation of milk to public health; handling and care of milk in the home; methods used in production of sanitary and certified milk. Five exercises a week; four weeks.

4. Dairy Laboratory.

Mr. Coons

Consists of

- | | |
|---|---------------------|
| First week—Two 2-hour periods in Babcock testing. | |
| Second week—Two 2-hour | " Market milk work. |
| Third week—Two 2-hour | " Separator work. |
| Fourth week—Two 2-hour | " Butter making. |

Students taking this course are required to take Course 3.

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5. Poultry Breeding and Management.

Professor Graham

This covers: Poultry house construction; incubation and brooding; care of poultry in summer; winter egg production; marketing eggs and poultry; poultry diseases. Laboratory work consists of caring for incubators and brooders and managing young chicks, killing, picking, dressing and caponizing. As much practical work as possible is given; this includes poultry carpentry, caring for breeders and layers, also some elementary work in judging. Four lectures and one laboratory period a week; four weeks.

6. Farm Management and Farm Accounts.

Professor Foord

This course consists largely of a discussion of some of the problems that confront the farmer, and the factors which govern successful farm management; the principles of farm accounting. Five exercises a week; first two weeks.

7. Farmers' Exchanges.

Professor Damon

Consists of ten lectures on the possibilities, methods and benefits of farmers' exchanges for purchasing supplies, selling milk, eggs, poultry, fruit and other farm products; building storages; utilizing surplus and unmarketable products; community breeding associations, boys' marketing clubs, and the like, how to form them and run them successfully. Five exercises a week; last two weeks.

GROUP B

HORTICULTURE, FORESTRY, LANDSCAPE GARDENING

8. Fruit Growing.

Professor Chenoweth

A study of modern methods of propagating, planting, cultivat-



A Demonstration of Spraying Apparatus

ing, pruning, fertilizing and spraying fruit trees; planning and managing orchards; selling fruit. Lectures, demonstrations and field exercises. Five exercises a week; four weeks.

9. Vegetable Gardening.

Professor Thomson

This course

"THE AMHERST MOVEMENT"

consists almost wholly of practical field exercises in planting, training and cultivating vegetables, and while no special effort is made to put the work into common school form, the exercises are especially valuable to school garden teachers. Limited to twenty-five pupils. Two lectures and three laboratory exercises a week; four weeks.

10. Amateur Floriculture.

Professor Nehrling

Covers the growing of flowers in the home and school garden. The course is designed to familiarize the student with the subjects of containers, potting and potting soils, fertilizers, insecticides, and the propagation and culture of plants suitable for the window garden. Lectures and demonstrations. Five exercises a week; first two weeks.

11. Garden Flowers.

Professor Nehrling

A rather detailed study of the several varieties; propagation and culture of bulbs, annuals, herbaceous perennials, and bedding plants. The work is supplemented with discussions on the planting of formal flower gardens and informal borders. Lectures, demonstrations, and field trips. Five exercises a week; last two weeks.

12. Forestry.

Professor Clark

Short trips will be made to identify and study the habits of growth of our native and commonly introduced species of trees. These trips will be alternated with lectures on tree growth, tree planting, wood lot management and general silviculture. Five exercises a week; four weeks.



13. Garden Making.

Professor Waugh

Class in Vegetable Gardening

Devoted chiefly to ornamental garden planning and the ways of making garden life popular and enjoyable, with such practical instruction as is necessary in the simpler forms of gardening. Five exercises a week; first two weeks.

14. Civic Improvement.

Mr. Smith

Instruction as to how best to organize and carry on civic better-

"THE AMHERST MOVEMENT"

ment; the various technical problems involved, the principles on which they are to be solved, with special reference to rural conditions. Five exercises a week; last two weeks.

GROUP C SCIENCES RELATED TO AGRICULTURE

No course in elementary chemistry is offered, and the two half-session courses in chemistry are strictly agricultural in character. While no definite prerequisite is necessary some knowledge of chemistry is desirable.

15. Chemistry of Fertilizers and Soils. *Professor Peters*

This course includes the preparation from natural sources of superphosphate, sulfate of potash, muriate of potash, the double sulfate of potash-magnesia; caustic potash from wood ashes; ammonium sulfate from gas liquor; potassium nitrate from chili salt-peter. It also includes a study of the absorption of these salts by the soil and a qualitative analysis of the soil. The discussions are informal and are gathered about the topics at hand. High School Chemistry is necessary for a proper understanding of the work. Five two-hour exercises a week; first two weeks.

16. Chemistry of Insecticides. *Professor Peters*

The following substances are prepared; lead nitrate and lead arsenate; copper sulfate from which is made Paris green and Bordeaux mixture; lime-sulfur and emulsions. The chemistry of these various substances is discussed in reference to their manufacture, use and action in the orchard. (An elementary course in chemistry is presupposed.) Five two-hour exercises a week; last two weeks.

17. Plant Experiments and School Demonstration Material.

Mr. McLaughlin

A lecture course illustrated by simple experiments in plant life, with home-made apparatus and methods of preparing plant material useful in schools, such as seeds and seedlings, common plant diseases, etc. A useful course for science teachers and others interested in plant life. Five exercises a week; last two weeks.

18. General Botany. *Professor Osmun*

An outline of the anatomy, morphology, and physiology of higher plants. This course is especially suited to the needs of teachers of science and nature study and to amateur botanists. Previous training in the subject is not required. Five exercises a week; first two weeks.

19. Ferns and Flowerless Plants. *Professor Osmun*

As outlined, this is very largely a laboratory course, consisting of

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microscopic and field study of lower forms of plant life, including algæ, fungi, mosses and ferns. The major portion of the time may be devoted to some special group, such as the ferns, if desired by the class. Previous training in botany is required. Limited to twenty pupils. Three two-hour exercises; first two weeks.

20. Bird Life. *Mr. Maynard*

A first-hand study of the local bird fauna, conducted largely in the field. Special attention is given to economic relations of the birds and to nesting habits. Five exercises a week; four weeks.

21. Insect Life. *Professor Fernald*

An introductory course which has been arranged with particular reference to the needs of teachers in grade schools and high schools who are expected to treat of insects in their classes, either as a part of nature study or in their relation to agriculture. The course is also planned for persons, not teachers, who wish a general knowledge of insect pests and methods of control. A part of the time is spent in the field, studying living insects, their habits, the injuries they cause, and their identification. Five exercises a week; four weeks.

22. Methods of Collecting in Entomology. *Professor Fernald*

In order to at least partially meet the increasing desire to obtain collections for use in schools, for nature study teaching, etc., this course is arranged to cover the subjects of securing, preserving, mounting and preparing collections of the common insects. The work is largely in the field and the collections prepared may be kept by those making them. Besides making the collections, the work and habits of insects are studied. Materials furnished at cost. Four two-hour periods a week; four weeks.

23. Beekeeping. *Professor Gates and Mr. Byard*

This course is designed particularly for school teachers or beginners in the subject. Comprises the elementary and practical features of the beekeeping industry, including equipment, handling and manipulation of bees, essential apparatus, a discussion of the diseases and races of the honey bee, the utilization of bees as nature study material in the lecture and schoolroom, as well as for pleasure. Five lectures and such laboratory periods as can be arranged each week; last two weeks.

GROUP D

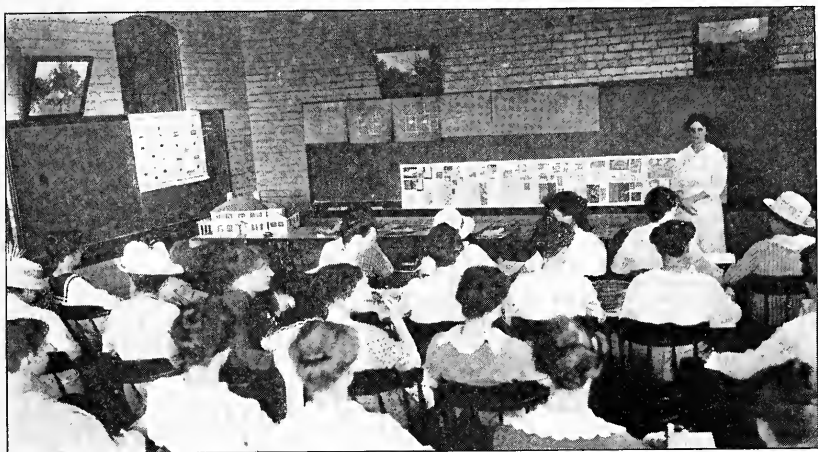
HOME ECONOMICS, PRACTICAL ARTS

24. Foods and House Construction.

Professor Comstock and Miss Sayles

A definite study outlining the several food principles governing normal and special diets. The planning of menus, cost of materials

"THE AMHERST MOVEMENT"



Class in HouseFurnishing and Decoration

and their preparation are discussed during the first two weeks. Lectures are given on house construction and remodeling, sanitation and decoration during the second two weeks. Demonstrations are given in the preparation and serving of milk, eggs, cheese, cereals, beverages, vegetables, canning fruits and vegetables, meats, bread, baking powder mixtures, salads, desserts. Three lectures and two demonstrations a week; four weeks.

25. Household Administration.

Professor Comstock

General topics pertaining to labor saving appliances, budget making and account keeping, and organizing the work of the household, are considered. Five exercises a week; first week.

26. Personal Hygiene and Home Nursing.

Professor Comstock

Value of rest and sleep; care of eyes, ears, nose, throat, feet and clothing, and discussion of related subjects, are the topics considered under personal hygiene. In home nursing such subjects as first aid, home medicine chest, contagious diseases, and bed-making are discussed. Three exercises a week; four weeks.

27. General Home Economics.

Professor Comstock

A course planned to acquaint students with the history, work and literature of Home Economics and its value as a part of a girl's education. Five exercises a week; last two weeks.

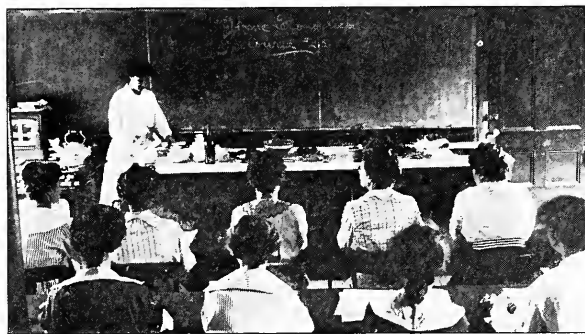
28. Home Economics for Rural and Small Village Schools.

Professor Comstock and Miss Sayles

Designed primarily to assist teachers in adapting home economics

"THE AMHERST MOVEMENT"

lessons to rural needs. Methods of presenting work form a large feature of the course. Three weeks given to the discussion of food and nutrition and one week to sanitation and handwork. A study



A Class in Cookery

is made of necessary equipment for cookery in small schools. Demonstrations are given in the preparation of cereals, milk, eggs, cheese, vegetables, fruit, bread, baking powder mixtures, meat and meat substitutes, salads, simple desserts, cake,

canning of fruits and vegetables, school lunches, table setting and serving. Five lectures and three demonstrations a week; four weeks.

29. Sewing.

Miss Sayles

This course is offered for two purposes:—(1) to enable teachers to adapt sewing to the needs of the rural school; (2) for practice in home sewing. The course consists of work in the use of the principal stitches applied directly to the making of articles; selection of fabrics; simple household tests to detect adulterations in fabrics; pattern cutting and adjustment; and the care and repairing of clothing. Five exercises a week; four weeks.

30. Design and Practical Arts. (1).

Mr. Ried

Lectures and laboratory work developing the value of design as a rural school asset. Work in binding and its various problems, basketry elementary weaving, thin and thick cardboard construction, leather work, bagging projects and rural dyeing; also other phases of rural pre-vocational subject matter, also rural avocational craft-work. Those taking this work should bring 9" x 12" drawing paper, carbon paper, scissors, ruler, eraser, knife and pencils. Five exercises a week; four weeks.

31. Practical Arts (2).

Mr. Ried

An interpretation of the new state course in drawing and handwork with laboratory periods. This course has been especially outlined for country schools and has already made radical changes in school arts. Given if ten or more call for it. Class limited to twenty. Five exercises a week; four weeks.

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Laboratory Class in Design and Practical Arts

GROUP E

ORGANIZED PLAY AND RECREATION

32. Organized Play and Recreation.

Mr. Hermann

A study of rural recreation and a résumé of the place which organized play may take in community development. Methods of organizing and directing games, athletics, festivals and pageantry are taken up. Demonstrations form a feature of the work. Three lectures a week with extra afternoon demonstrations; four weeks.

33. Plays and Pageantry.

Miss Ida Hall

A course to meet the demand of teachers and social workers for simple methods of applying dramatic principles to school and neighborhood work. Opportunities to present short dramas will be offered to members of this class. Five exercises a week; first two weeks.

GROUP F

ELEMENTARY AGRICULTURE AND SCHOOL GARDENS FOR TEACHERS

34. Elementary Agriculture.

Professor Thomson

This course is designed to meet the needs of teachers who are called upon to teach agriculture in rural and village schools, and of those who wish to make the work of these schools function better in the lives of their pupils. The course will include discussions upon the propagation of plants, the use of fertilizers, tillage of soils, the care of manures, the cultivation of some of the important field and garden

(Continued on page 18)

Summer School

	8.25—9.15	9.25—10.15
Monday	1 Soil Fertility 4 weeks 10 Amateur Floriculture 1st 2 weeks 11 Garden Flowers last 2 weeks 15 Chemistry of Fertilizers 1st 2 weeks 16 Chemistry of Insecticides last 2 weeks 21 Insect Life 4 weeks 24 Foods and House Construction 4 weeks 28 Home Economics (Laboratory) 4 weeks 32 Organized Play 4 weeks 33 Plays and Pageants 1st 2 weeks 34 Elementary Agriculture 4 weeks 36 Re-direction of the Rural School July 12-18 41 Practical Agriculture July 12-18	2 Breeds and Types 4 weeks 8 Fruit Growing 4 weeks 15 Chemistry of Fertilizers 1st 2 weeks 16 Chemistry of Insecticides last 2 weeks 17 Plant Experiments last 2 weeks 18 General Botany 1st 2 weeks 26 Personal Hygiene and Home Nursing 4 weeks 28 Home Economics (Laboratory) 4 weeks 30 Design and Practical Arts 4 weeks 35 Home and School Gardens 2nd week 37 Gardening and Canning July 12-18 39 Health July 12-18 42 Cooperation and Marketing July 12-18
Tuesday	1 Soil Fertility 10 Amateur Floriculture 11 Garden Flowers 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 21 Insect Life 24 Foods and House Construction (Laboratory) 33 Plays and Pageants 34 Elementary Agriculture (Laboratory) 36 Re-direction of the Rural School 41 Practical Agriculture	2 Breeds and Types 8 Fruit Growing 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 17 Plant Experiments 18 General Botany 24 Foods and House Construction (Laboratory) 30 Design and Practical Arts 34 Elementary Agriculture (Laboratory) 35 Home and School Gardens 39 Health 42 Cooperation and Marketing
Wednesday	1 Soil Fertility 10 Amateur Floriculture 11 Garden Flowers 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 21 Insect Life 24 Foods and House Construction 28 Home Economics (Laboratory) 32 Organized Play 33 Plays and Pageants 34 Elementary Agriculture 36 Re-direction of the Rural School 41 Practical Agriculture	2 Breeds and Types 8 Fruit Growing 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 17 Plant Experiments 18 General Botany 26 Personal Hygiene and Nursing 28 Home Economics (Laboratory) 30 Design and Practical Arts 35 Home and School Gardens 37 Gardening and Canning 39 Health 42 Cooperation and Marketing
Thursday	1 Soil Fertility 10 Amateur Floriculture 11 Garden Flowers 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 21 Insect Life 24 Foods and House Construction (Laboratory) 33 Plays and Pageants 34 Elementary Agriculture (Laboratory) 36 Re-direction of the Rural School 41 Practical Agriculture	2 Breeds and Types 8 Fruit Growing 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 17 Plant Experiments 18 General Botany 24 Foods and House Construction (Laboratory) 30 Design and Practical Arts 34 Elementary Agriculture (Laboratory) 35 Home and School Gardens 39 Health 42 Cooperation and Marketing
Friday	1 Soil Fertility 10 Amateur Floriculture 11 Garden Flowers 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 21 Insect Life 24 Foods and House Construction 28 Home Economics (Laboratory) 32 Organized Play 33 Plays and Pageants 34 Elementary Agriculture 36 Re-direction of the Rural School 41 Practical Agriculture	2 Breeds and Types 8 Fruit Growing 15 Chemistry of Fertilizers 16 Chemistry of Insecticides 17 Plant Experiments 18 General Botany 26 Personal Hygiene and Nursing 28 Home Economics (Laboratory) 30 Design and Practical Arts 35 Home and School Gardens 37 Gardening and Canning 39 Health 42 Cooperation and Marketing
Saturday	July 8 Forenoon, Regular Classes; Afternoon Excursion—Sugar Loaf Mountain. July 15 Forenoon, Regular Classes; Afternoon Excursion—(Place to be announced.) July 22 All day Excursion—"Old Deerfield."	

Schedule 1916.

10.25—11.15		11.25—12.15		Afternoon
3 Modern Dairying	4 weeks	6 Farm Management and Accounts	1st 2 weeks	4 Dairying (Laboratory)
5 Poultry	4 weeks	7 Farmers' Exchanges	last 2 weeks	1.30—3.30 4 weeks
9 Vegetable Gardening (Laboratory)	4 weeks	9 Vegetable Gardening (Laboratory)	4 weeks	Class Excursions
13 Garden Making	1st 2 weeks	12 Forestry	4 weeks	Seminars
14 Civic Improvement	last 2 weeks	19 Ferns and Flowerless Plants	1st 2 weeks	
19 Ferns and Flowerless Plants	1st 2 weeks	20 Bird Life	4 weeks	
22 Methods of Collecting in Entomology	4 weeks	22 Methods of Collecting in Entomology	4 weeks	
25 Household Administration	1st week	23 Beekeeping	last 2 weeks	
27 General Home Economics	last 2 weeks	28 Home Economics for Rural Schools	4 weeks	
37 Gardening and Canning	July 12-18	29 Sewing	4 weeks	
38 The New Rural School	July 12-18	31 Practical Arts (2)	4 weeks	
40 Organization	July 12-18	44 Rural Community Planning	July 12-18	
43 The New Rural Church	July 12-18			
3 Modern Dairying		6 Farm Management and Accounts		4 Dairying (Laboratory)
5 Poultry		7 Farmers' Exchanges		1.30—3.30
9 Vegetable Gardening (Laboratory)		12 Forestry		Organized Play and Recreation 3.30
13 Garden Making		20 Bird Life		Social Evening 8—10 P. M.
14 Civic Improvement		22 Methods of Collecting in Entomology		
22 Methods of Collecting in Entomology		23 Beekeeping		
25 Household Administration		28 Home Economics for Rural Schools		
27 General Home Economics		29 Sewing		
37 Gardening and Canning		31 Practical Arts (2)		
38 The New Rural School		44 Rural Community Planning		
40 Organization				
43 The New Rural Church				
3 Modern Dairying		6 Farm Management and Accounts		Regular Mid-Week Excursion.
5 Poultry		7 Farmers' Exchanges		
9 Vegetable Gardening (Laboratory)		9 Vegetable Gardening (Laboratory)		
13 Garden Making		12 Forestry		
14 Civic Improvement		19 Ferns and Flowerless Plants		
19 Ferns and Flowerless Plants		20 Bird Life		
22 Methods of Collecting in Entomology		22 Methods of Collecting in Entomology		
25 Household Administration		23 Beekeeping		
27 General Home Economics		28 Home Economics for Rural Schools		
37 Gardening and Canning		29 Sewing		
38 The New Rural School		31 Practical Arts (2)		
40 Organization		44 Rural Community Planning		
43 The New Rural Church				
3 Modern Dairying		6 Farm Management and Accounts		Organized Play and Recreation 3.30
5 Poultry		7 Farmers' Exchanges		Regular Evening Lecture 7.30 P. M.
9 Vegetable Gardening (Laboratory)		12 Forestry		
13 Garden Making		20 Bird Life		
14 Civic Improvement		22 Methods of Collecting in Entomology		
22 Methods of Collecting in Entomology		23 Beekeeping		
25 Household Administration		28 Home Economics for Rural Schools		
27 General Home Economics		29 Sewing		
37 Gardening and Canning		31 Practical Arts (2)		
38 The New Rural School		44 Rural Community Planning		
40 Organization				
43 The New Rural Church				
3 Modern Dairying		6 Farm Management and Accounts		Class Excursions
5 Poultry (Laboratory)		7 Farmers' Exchanges		Seminars
9 Vegetable Gardening (Laboratory)		9 Vegetable Gardening (Laboratory)		Social Evenings 8—11 P. M.
13 Garden Making		12 Forestry		
14 Civic Improvement		19 Ferns and Flowerless Plants		
19 Ferns and Flowerless Plants		20 Bird Life		
25 Household Administration		23 Beekeeping		
27 General Home Economics		28 Home Economics for Rural Schools		
37 Gardening and Canning		29 Sewing		
38 The New Rural School		31 Practical Arts (2)		
40 Organization		44 Rural Community Planning		
43 The New Rural Church				

"THE AMHERST MOVEMENT"

crops, the study of insect pests and plant diseases. A brief description of feeds and the different breeds of farm animals is given. Three lectures and two laboratory periods a week; four weeks.



Organized Play and Recreation

35. Home and School Gardens.

Professor Hart

Practice in care of a garden; supervision of children at work in their gardens on M. A. C. grounds; visiting and inspection of home gardens in Amherst and vicinity. Conferences on methods, plans, and educational value of gardens; the general pedagogy of agriculture; the re-direction of rural education. Five exercises during second week.

SEMINARS

In order that those who attend the Summer School may obtain some idea of present-day organized movements in agriculture the following Seminars have been arranged. These will be held between the hours of 3:00 and 5:00 on the days mentioned, and, weather permitting, will be held in the open air. The Seminars are open to the public as well as to Summer School Students.

"THE AMHERST MOVEMENT"

- July 7. "The State and Nation-Wide Extension Work Movement." Leader, Director William D. Hurd.
- July 10. "The Cooperative Organization Movement in Agriculture." Leader, Dr. A. E. Cance.
- July 14. "The Country Life Movement." Leader, President Kenyon L. Butterfield.
- July 17. "Community Planning." Leader, Professor E. L. Morgan.
- July 21. "The Boys' and Girls' Club Work Movement." Leader, Professor O. A. Morton.
- July 24. "Town Planning and Civic Improvement." Leader, Professor F. A. Waugh.

GENERAL PLAN OF THE SUMMER SCHOOL WORK

The formal instruction in the Summer School is given in definite courses herein described. From these each pupil may elect courses of not less than ten nor more than fifteen exercises a week, unless a larger or smaller amount of work is especially allowed by the Supervisor. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Excursions are arranged for every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. All excursions are in charge of an instructor.

Round table and special discussions are arranged by various instructors as their courses require.

A course of evening lectures on popular topics relating to the work of the school forms a feature of the general program. Like everything else connected with the Summer School, this lecture course is entirely free to all students.



1915 Summer School Group

"THE AMHERST MOVEMENT"

COLLEGE EQUIPMENT

The Massachusetts Agricultural College is maintained by the Federal government and by the State of Massachusetts for teaching and investigation in agriculture in the broadest sense. The College has over 500 acres of land most of which is in a high state of cultivation and illustrates most of the leading agricultural industries of Massachusetts. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with dairy cattle; there are good horses, pure-bred swine, sheep and poultry; there are fields of corn, potatoes, clover and grass in season; orchards of apple, peach, plum and pear trees; tracts of good forest land, nurseries, market gardens; in addition, a good school garden, maintained cooperatively by the College and the Amherst schools, will be in operation. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology and chemistry, dealing in the most thorough manner with these special sciences. All of this equipment (much more than can be described or even named) is placed at the service of the Summer Schools.

THE LIBRARY

The college library occupies the entire lower floor of the Chapel building and contains over 50,000 volumes in addition to a large number of pamphlets. The library ranks extremely well with the agricultural libraries of the country. Summer School students are able to find splendid material in every line of college work, especially in agriculture, horticulture, botany, entomology, and sociology. The reading room is provided with a variety of magazines, encyclopedias, and reference books, in addition to the newspapers and agricultural weeklies.

The library hours are from eight a. m. to twelve m. and from one to five p. m. every week day, and from nine a. m. to two p. m. on Sundays. The librarian and his assistants are constantly on hand, ready and willing to be of assistance to Summer School students.

ELECTION OF COURSES

Election of courses should be made at the time of registration. Every election is subject to the approval of the Supervisor and of the instructor whose course is elected. As it is necessary to schedule several courses against each other, certain combinations of courses are made unavailable. It should be specially noticed that certain courses are offered to a limited number of pupils only, and as a rule pupils are accepted in these courses in the order of application. Each pupil should choose such combinations of courses as will keep two or three subjects in hand at the same time. This will meet the require-

"THE AMHERST MOVEMENT"

ment that each one must take at least ten and not more than fifteen exercises a week, unless permitted to take more or less by special order of the Supervisor. See Schedule of Courses and hours at which they come on pages 16 and 17.

GROUPING OF COURSES

Those desiring work in general agriculture and animal husbandry should elect from courses Nos. 1, 2, 3, 4, 5, 6, 7.

Those desiring work in horticulture and forestry should elect from courses, Nos. 1, 6, 7, 8, 9, 10, 11, 12, 13, 14, 21, 22, 23.

Those wishing to make desirable combinations of the home economics courses should elect from Nos. 24, 25, 26, 27, 28, 29, 30, 31.

Those desiring to train themselves for supervising playgrounds and gardens from Nos. 1, 9, 10, 11, 13, 14, 20, 21, 30, 31, 32, 33, 34, 35.

Those interested in high school science should elect from Nos. 1, 15, 16, 17, 18, 19, 20, 21, 22, 23, 34, 35.

Those interested in rural sociology, agricultural economics and leadership in country life should elect from Nos. 14, 28, 32, 33, 35, 36, 38, 42, 43, 44.

REGISTRATION, ATTENDANCE, ETC.

Those who expect to attend should register as early as possible. **Registration fee for the Summer School of Agriculture and Country Life is \$5, payable at the time application is made.** Remittance should accompany application blank and should be made payable to the College Treasurer. A Summer School registration blank will be found in the back part of this bulletin. Registration fees will be refunded to those who find it impossible to attend the school.

Attendance is required in the courses elected. Some sort of examination, test or permanent note book will be required in each course. Those who complete at least three courses in a satisfactory manner, including practically perfect attendance, will be given certificates at the close of the term.

There are no rules or regulations. This absence of rules has worked admirably in the past, and it gives everyone a sense of freedom based on personal responsibility, the basis of all proper government, whether in school, college or the community.

Tuition is absolutely free, and there are no incidental charges. The College is supported by the State and the Federal governments, and receives no payments whatever from Summer School pupils except for room, board, and the registration fee.

ROOMS, BOARD, ETC.

Rooms will be provided in the College dormitories and in private homes adjoining the College grounds. In general, the dormitory

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rooms are in suites of two bedrooms, opening into one study room, the bedrooms furnished with single beds. These rooms are located in two dormitories known as North College and South College and are reserved for women students exclusively. The toilet and bathrooms are in the basements; water is not provided in the rooms. While the appointments in general are not those of a high-priced summer hotel, they are sanitary and comfortable, and have been found pleasant by men students for many years and by the women students of the Summer School during the summer. A uniform rate of \$1.25 a week for each person will be charged for these rooms, and each pupil will be expected to supply her own blankets, sheets, pillow cases, towels, etc. Convenient arrangements for laundry work may be made in Amherst.

All requests for dormitory rooms must be made to, and rooms will be assigned by, the College Treasurer. A deposit of \$2.00 is required in order to have a room in a dormitory reserved. This deposit is not refunded to those who find it impossible to attend.

The College will also supply a limited number of first-class United States army wall tents for those who wish them. Each tent will accommodate two persons. The tents will be placed in a pleasant and convenient location on the College campus, and every reasonable provision will be made for the comfort of the occupants. This form of domicile has been found very acceptable in other summer schools, chautauquas and camps. Those who care for real outdoor life at its best will find these arrangements genuinely enjoyable. The charge for these tents will be \$1.00 a week for each person.

Rooms outside the College vary considerably in their accommodations and somewhat in price, the charge ranging from \$1.50 to \$2.50 a week for each person. **A list of available rooms in the village will be furnished Summer School students at the time of registration. Every effort will be made by those in charge to see that everyone has comfortable accommodations.**

A few furnished houses are usually available in Amherst during July and August at reasonable rentals.

Good meals are served in Draper Hall, on the College grounds. Meals will be served on an a la carte basis at very low cost and should not amount to more than \$4.50 or \$5.00 a week. Good boarding places can be secured outside the College if desired.

A college supply store is maintained in the basement (west entrance) of North College for the convenience of Summer School students.

ATHLETICS AND RECREATION

Athletics and sports of various kinds occupy a prominent place in the Summer School. Tennis tournaments for both men and women are held and baseball teams are organized. Contests with teams from nearby towns are held, subject to the approval of the proper committee. This year, under competent supervision, demon-

"THE AMHERST MOVEMENT"

strations of organized play, recreation, folk dancing, and so forth will be given. Late afternoon and early evening periods will be used for this purpose.

The region around Amherst is especially rich in attractive places for tramping, excursions and picnics. The management of the Summer School usually arranges a suitable amount of this form of recreation.

EVENING LECTURES AND SOCIAL LIFE

The management of the Summer School provides at least one evening lecture each week. These lectures are usually given by men of national repute and deal with practical, social and economic subjects related to rural life.

One or two social evenings are arranged for each week. These social evenings are under the direction of a committee of the faculty, working with the Summer School students. These events together with evening lectures, the regularly scheduled Wednesday and Saturday excursions, the afternoon field trips for study, make life at the Summer School extremely enjoyable as well as profitable.

(For Summer School application blank see last page of bulletin.)

(For Schedule see pages 16 to 17.)



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THE SCHOOLS FOR RURAL SOCIAL SERVICE

JULY 12—JULY 18, INCLUSIVE

The idea of these schools is to give those who can spend only a few days at the college a chance to obtain information as to how they as leaders may better serve the communities in which they reside and work.

The schools are especially planned to assist clergymen, teachers, leaders and organizers of Club Work, Scout and Campfire Girls' organizations or for those engaged in other lines of Rural Social Service.

A registration fee of \$1.00 is charged those who attend these courses. See other pages of this bulletin for other work given in the regular Summer School, information as to living accommodations, expenses, etc.

A—SCHOOL FOR RURAL AND VILLAGE TEACHERS

JULY 12—JULY 18, INCLUSIVE.

These courses will be in charge of Prof. Hart, Prof. Morton and Miss Nash. They will be assisted by teachers who have accomplished definite and noteworthy tasks in rural education, as well as by supervisors and directors who are coordinating home and school work in a successful way.

36. Re-direction of the Rural School.

Professor Hart

Topics for discussion; rural supervision, rural schoolhouses and grounds; preparation of rural teachers; rural school course of study; the school as a factor in rural life; agriculture as a factor in education.

37. Gardening and the Cold-Pack Method of Canning.

Professor Morton

Planning and supervision of home, school and community gardens are discussed. At least three two-hour periods are given to instruction by demonstrations of the cold-pack method of canning greens, fruits and vegetables. Anyone interested in this work will be admitted to these exercises.

38. The New Rural School.

Miss Nash

Topics: Recreation on the country school grounds; playground equipment; the schoolroom and its decoration; country school program and class organization; cooking, equipment, methods, noon lunch; sewing; correlation of school subjects with home activities through club work; leadership of the country teacher.

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B—SCHOOL FOR ORGANIZATION OF WORK FOR GIRLS AND WOMEN

JULY 12—JULY 18, INCLUSIVE

Under this school some special courses will be given which will be of particular interest to leaders and others who may desire to organize group work for women in their communities. Twenty-four lectures will be offered by specialists from the college and elsewhere who are well fitted to discuss these subjects. This work is under the direction of Professor Comstock.

36. Re-direction of the Rural School.

Professor Hart

(For description see Course 34.) July 12-18 inclusive.

39. Health.

The following topics will be discussed: Personal Hygiene, Dr. Evangeline W. Young; Transmission of Communicable Diseases, Dr. C. E. Marshall; Work of the Anti-Tuberculosis Association, Mr. Seymour H. Stone; Child Welfare Work, Miss Laura Comstock; Rural Nurse, Miss Ada Snowden.

40. Organization.

In this course information will be given on the following subjects: Government Clubs, Miss Ethel H. Nash; Citizenship Clubs, Miss Lorian P. Jefferson; Study Groups, Miss Laura Comstock; Camp Fire Work, Miss A. Gertrude Carter; Y. W. C. A. (eight-week clubs), Miss Anna M. Clark; Recreation Clubs, Ernst Hermann.

NOTE:—The last period of the forenoon is left vacant so that this group may enter Course 44 in the School for Clergymen.

C—SCHOOL FOR RURAL CLERGYMEN

JULY 12—JULY 18, INCLUSIVE.

In order that clergymen may better inform themselves on agricultural movements, Church Organization and Community Development the following courses will be offered especially for them this summer.

41. Practical Agriculture.

The following three options will be offered. Those registering will be given opportunity to elect either one. Any one or all of these courses will be given provided five or more elect the work.

- (a) The Principles and Practice of Small Fruit Growing.

Professor Chenoweth

- (b) The Principles and Practice of Poultry Raising.

Professor Graham

- (c) The Principles and Practice of Vegetable Gardening.

Professor Thomson

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42. Cooperation and Marketing.

Professor Cance

The principles and practice, methods and benefits of organized agriculture, cooperative buying and selling, markets and marketing of farm products, and rural credit.

43. The New Rural Church*.

Mr. Waterbury

A course discussing the actual conditions existing in rural parishes. How to organize parishes for more efficient work. The Church in its relation to the Country Life movement, etc.

44. Rural Community Planning.

Professor Morgan

This course is planned to cover a study of the principles and methods involved in practical community building; The Community Planning Idea; The Community Survey; The Community Council; The Community Program—what it is, how to get it, how to get results with it.

* This course is maintained by the Massachusetts Federation of Churches.

AGRICULTURAL CAMPS

JULY 3—29, 1916

ANNOUNCEMENT

During the month of July 1916, the Massachusetts Agricultural College will conduct three agricultural camps for boys and one for girls in connection with the regular Summer School of Agriculture and Country Life. Each camp will be of one week's duration. The college feels it has a direct duty to the boys of the state whose inclinations draw them toward agricultural pursuits. In addition to instruction along agricultural lines there will be a well balanced program of instruction in some of the vital problems of life, and periods will be devoted to athletics and other forms of recreation as shown in the tentative outline of a day's activities. The main purpose of these camps is fourfold:

1. To interest the boy in agriculture and country life. This is the primary object.
2. To impress on the boy his responsibilities as a member of society.
3. To teach the boy clean, wholesome sports, recreation, and proper spirit in competitive contests.
4. To demonstrate the value of a Boys' Camp as an educational factor.

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DATES OF THE CAMPS

First Camp.—July 3—July 11. Registration closes June 22.

Second Camp.—July 12—July 20. Registration closes July 3.

Third Camp.—July 21—July 29.

NOTE.—Those boys who were in the 1914 or 1915 Camps may register for the second camp only.

Only Agricultural Club prize winners will be admitted to the third camp.

The special camp for the girl winners in club work will also be held July 21—29.

ORGANIZATION OF THE CAMP

Selection of Boys

The selection of boys who are to receive the advantages of these camps will be left to the individuals in various organizations which may be interested. Granges, Y. M. C. A.'s, Churches, Clergymen, Scout Masters, Superintendents and Teachers are urged to select boys who might be benefited by a week of this kind, and to see that they are provided with necessary means in order to attend.

Each camp will be limited to fifty boys.

Boys between the ages of 12 and 17 years only will be admitted

Discipline

The camps will be under military discipline. Only those boys who are willing to conduct themselves in the proper manner and



One of the 1915 Boys' Camps

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observe the rights and comforts of others are invited to join the camps. All members of the camps are required to attend and participate in all meetings on the schedule unless prevented by illness.

There are only a few definite rules in connection with the camps.

1. There shall be no firearms in camp.
2. There shall be no smoking.
3. No camper is allowed to leave the college campus without permission.
4. A gentleman always.

Expenses

Eight dollars will be charged each boy for the week. This registration fee is used primarily for board, to help defray the cost of maintaining the camp and of instruction and supervision.

LOCATION OF THE CAMP

The camp is situated on the M. A. C. campus just south of the College Armory. The boys sleep in a large tent 40 by 70 feet, made of army duck. Each boy is provided with a spring wire cot. These cots are grouped into units of six, designated as "tents" and a leader is selected for each.

A smaller tent is used for the commandant's office. The medical outfit of the physical director's office is readily accessible.

Meals are obtained at the College Dining Hall.

TENTATIVE PROGRAM OF A DAY AT "BOYS' CAMPS"

- 6.00 A.M. "Reveille"—Setting up exercises, shower baths, dress.
- 7.00 A.M. Flag Raising.
- 7.15 A.M. Breakfast—Announcements for the day.
- 8.00 A.M. Camp Duties—"picking up."
- 8.20 A.M. Agricultural Lesson.
- 10.00 A.M. "Prepare for Inspection"—Make beds.
- 10.20 A.M. Morning Talk.
- 12.00 M. Tent Inspection.
- 12.30 P.M. Dinner.
- 1.00 P.M. "Quiet Hour"—Rest in tent, read, write letters home, study in library.
- 2.00 P.M. Games and Recreation—Tennis, baseball, track, swims.
- 4.30 P.M. Afternoon Specialties—Basketry, surveying, photography stock judging, etc.
- 6.00 P.M. Supper.

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6.45 P.M. "Colors."

7.00 P.M. Evening Specialty—Games, wig-wagging, "Weather-man," rope-tying, etc.

7.30 P.M. Evening Lecture or Open Night—Campfire, roasts, vaudevilles, etc.

9.15 P.M. "Tattoo"—Everybody in tents.—"Camp Newspaper."

9.30 P.M. "Taps"—Lights out.

THE POULTRY CONVENTION

JULY 19—JULY 21 INCLUSIVE.

Preparation is now being made for our Fourth Annual Poultry Convention. It is being developed along such lines as to make it of greatest interest and value to all interested in poultry keeping. There will be three full days of lectures and demonstrations with special features in the evenings. Men and women who have specialized along various lines and have national reputations as successful poultry keepers will be on the program. The Convention will be a clearing house for the latest and best in poultry-keeping information. If you are interested in poultry you cannot afford to miss the Convention.

Special features will be as follows:

1. Lectures by specialists of national reputation.
2. Demonstrations of the best methods of preparing poultry and poultry products for market.
3. Demonstrations of poultry houses and equipment.
4. Educational exhibit showing methods of successful poultry keeping.
5. Egg show and contest by Boys' and Girls' Poultry Clubs.
6. An opportunity to visit the College poultry plant as well as the new museums.

Separate complete Program will be ready June 1 and may be secured by writing.

WM. D. HURD, Director of the Extension Service, or

J. C. GRAHAM, Professor of Poultry Husbandry.

M. A. C., Amherst, Mass.

CONFERENCE ON RURAL ORGANIZATION

The conference on Rural Organization which has been held as a closing feature of the Summer School for the past seven years has this year been postponed until October.

This change is made with some regrets but the session of the graduate school of Agriculture at this College, during July, and other conflicting events make this arrangement seem advisable.

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Assurances have been received from practically all of the State Organizations which have helped to make the Summer Conference a success that they will cooperate and participate in the October Conference.

A full and complete program will be ready for distribution about September 1, 1916, and may be secured by writing,

WILLIAM D. HURD, Director of the Extension Service,
M. A. C., Amherst, Mass.

GRADUATE SCHOOL OF AGRICULTURE

A Graduate School of Agriculture of four weeks' duration is held every other year at some state college or university in the United States. In 1916 this school is to be held at the Massachusetts Agricultural College July 3 to 28, inclusive. This is the first time that this Graduate School has been held in New England and rather elaborate plans are being laid. It is under the auspices of the American Association of Agricultural Colleges and Experiment Stations and Dr. A. C. True, Director of the federal States Relations Service, is The Dean of the school. It is open to college graduates in all the professions of life and to such others connected with various colleges as may be recommended by their Faculties. Full details regarding the Graduate School can be secured by addressing Prof. Chas. E. Marshall Amherst, Massachusetts, who is the Assistant Dean.

SCHOOL OF ENGLISH FOLK SONG AND DANCE SUMMER SESSION

This school will be held at the Massachusetts Agricultural College, Amherst, June 24 to July 14, 1916, under the direction of Mr. Cecil J. Sharp of Stratford, England. Classes in Folk Songs, Children's Singing Games, Morris, Country and Sword dancing are held daily.

For information, circulars, etc., address Mrs. James J. Storrow, 417 Beacon Street, Boston, Mass.

THE REGION SURROUNDING AMHERST

Amherst is one of the most delightful towns in New England, and has long been noted for the natural scenic beauties surrounding it, and as an educational center. It is located in the heart of the Connecticut valley. The Holyoke range, Mt. Tom, Mt. Holyoke, Mt. Toby, the Orient, the Connecticut River, Rattlesnake Gutter, Whately Glen, Old Deerfield and other places of great scenic beauty and historic interest are within easy walking, trolley or driving distance. The Berkshire and Hampshire Hills country is easily accessible.

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The climate is good and usually not excessively warm during July.

The surroundings of the Summer Schools, the organization and methods of work, are such as to make a stay of two to four weeks enjoyable in every way. It furnishes the pleasantest sort of outdoor life, with just enough of work and recreation, under the simplest possible organization. From the first, special attention has been given to the outdoor exercises and recreation features of the program, and these will be still further emphasized in 1916.

LOCATION OF AND DIRECTIONS FOR REACHING AMHERST

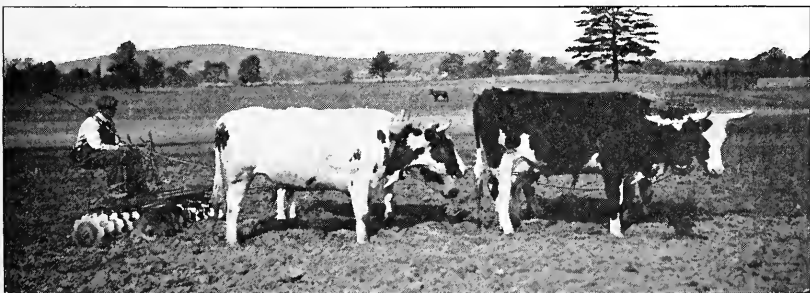
Amherst is ninety-eight miles west of Boston and twenty-five miles from Springfield. It can be reached from Boston over the Boston and Maine Railroad (Southern Division from North Station) or by the Boston and Albany Railroad from South Terminal Station via Palmer, thence to Amherst over the Central Vermont Railroad.

It may also be reached from Springfield or Greenfield by the Boston and Maine Railroad via Northampton, or by trolley from Springfield via Holyoke or Northampton.

From New York, take New York, New Haven and Hartford Railroad to Springfield, then to Amherst by train or trolley as already stated.

Persons coming from Albany, Buffalo and the West would best come to Springfield and then to Amherst as stated above.

For further information concerning the Summer Schools, write
WILLIAM D. HURD, Supervisor of Short Courses.
Massachusetts Agricultural College, Amherst, Mass.



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THE MASSACHUSETTS AGRICULTURAL COLLEGE

Summer School of Agriculture—1916

Application for Registration.

Name, (Mr., Mrs. or Miss)
Post Office.....Street Address.....
State.....Present Occupation.....
Schools previously attended.....
Reference.....

Name of person to whom word may be sent in case of illness or
accident.....

Address of above person.....

Consult the schedule and place an X **before** each course you
wish to take.

COURSE

- 1 Soil Fertility
- 2 Breeds and Types of Live Stock
- 3 Modern Dairying
- 4 Dairy Laboratory
- 5 Poultry Breeding and Management
- 6 Farm Management and Farm
Accounts
- 7 Farmers' Exchanges
- 8 Fruit Growing
- 9 Vegetable Gardening
- 10 Amateur Floriculture
- 11 Garden Flowers
- 12 Forestry
- 13 Garden Making
- 14 Civic Improvement
- 15 Chemistry of Fertilizers
- 16 Chemistry of Insecticides
- 17 Plant Experiments and School
Demonstration Material
- 18 General Botany
- 19 Ferns and Flowerless Plants
- 20 Bird Life
- 21 Insect Life
- 22 Collecting in Entomology

COURSE

- 23 Beekeeping
- 24 Foods and House Construction
- 25 Household Administration
- 26 Personal Hygiene and Home Nurs-
ing
- 27 General Home Economics
- 28 Home Economics for Rural and
Small Village Schools
- 29 Sewing
- 30 Design and Practical Arts (1)
- 31 Practical Arts (2)
- 32 Organized Play and Recreation
- 33 Plays and Pageantry
- 34 Elementary Agriculture
- 35 Home and School Gardens
- 36 Re-direction of the Rural School
- 37 Gardening and Canning
- 38 The New Rural School
- 39 Health
- 40 Organization for Women and Girls
- 41 Practical Agriculture
- 42 Cooperation and Marketing
- 43 The New Rural Church
- 44 Rural Community Planning

Send this blank to the Supervisor.

I wish to take.....weeks' work, beginning.....

Room preference (read bulletin carefully).....

Accepted.....

Supervisor.

Date received.....Fees.....Ref.....

The M. A. C. Bulletin

AMHERST, MASSACHUSETTS

VOL. VIII

MAY, 1916

No. 4

CATALOG *of* GRADUATES *and* FORMER STUDENTS *of the* MASSACHUSETTS AGRICULTURAL COLLEGE



PUBLISHED SIX TIMES A YEAR BY THE

Massachusetts Agricultural College

JANUARY, FEBRUARY, MARCH, MAY, SEPTEMBER, OCTOBER

ENTERED AS SECOND CLASS MATTER AT THE POST OFFICE, AMHERST

CATALOG OF GRADUATES AND FOR-
MER STUDENTS OF THE MASSA-
CHUSETTS AGRICULTURAL
COLLEGE

PUBLISHED BY
THE COLLEGE AND ASSOCIATE ALUMNI
MAY, 1916

PREFACE

THE *first* general catalog of this college was published privately by Goodell and Tuckerman, '78, at Commencement 1886. The *second*, which was "A General Catalogue of Officers and Students," arranged by Goodell, was published by the college in 1897. The *third*, a Catalogue of Graduates and former Students, was published jointly by the College and Associate Alumni in 1913. This, the *fourth* of the series, is also published jointly by the College and Associate Alumni.

The records in the College secretary's office were the foundation for the data in this catalog. These have been verified every year by return post cards sent to all alumni and former students. The last information was collected during 1915. In addition to this material, use has been made of the 1897 catalog, and to prevent possible errors of omission, members of the graduating class have been checked from each college catalog from 1871 to 1916, inclusive.

Early in the work the names of those whose addresses were unknown were sent to each class secretary, and return post cards were used to collect information from any sources which they suggested. Later, complete copy of each class list was sent to the class secretary for correction. The several fraternities at the College have been consulted and use made of all the information they could furnish.

A geographical index and an alphabetical list, the new system for class reunions, lists of class secretaries, and secretaries of alumni clubs have been included.

CHARLES A. PETERS,
Secretary of the Associate Alumni.

RALPH J. WATTS,
Secretary, Massachusetts Agricultural College.

May 15, 1916.

CLASS SECRETARIES

- 1871 E. E. Thompson, 5 Jaques Ave., Worcester, Mass.
- 1872 F. E. Kimball, 17 Harvard St., Worcester, Mass.
- 1873 Dr. Charles Wellington, Amherst, Mass.
- 1874 D. G. Hitchcock, Warren, Mass.
- 1875 P. M. Harwood, 136 State House, Boston, Mass.
- 1876 C. Fred Deuel, Amherst, Mass.
- 1877 Atherton Clark, 231 Waverly Ave., Newton, Mass.
- 1878 C. O. Lovell, 201 Darke Block, Regina, Sask., Canada.
- 1879 Dr. R. W. Swan, 41 Pleasant St., Worcester, Mass.
- 1880 Alvan L. Fowler, 413 Federal Bldg., Philadelphia, Pa.
- 1881 Dr. J. L. Hills, 59 North Prospect St., Burlington, Vt.
- 1882 G. D. Howe, 38 Whittier Ave., Springfield, Mass.
- 1883 Dr. J. B. Lindsey, Amherst, Mass.
- 1884 E. A. Jones, New Canaan, Ct.
- 1885 Dr. E. W. Allen, 1923 Biltmore St., Washington, D. C.
- 1886 Dr. Winfield Ayres, 1616 Madison Ave., New York, N. Y.
- 1887 F. H. Fowler, Shirley, Mass.
- 1888 H. C. Bliss, 14 Mechanic St., Attleboro, Mass.
- 1889 Franklin W. Davis, 85 Colberg Ave., Roslindale, Mass.
- 1890 David Barry, 398 Walnut St., Newtonville, Mass.
- 1891 Dr. H. T. Shores, 177 Elm St., Northampton, Mass.
- 1892 H. M. Thomson, Amherst, Mass.
- 1893 F. A. Smith, Hathorne, Mass.
- 1894 Dr. S. F. Howard, Northfield, Vt.
- 1895 Professor E. A. White, Dept. of Floriculture, Cornell University, Ithaca, N. Y.
- 1896 A. S. Kinney, South Hadley, Mass.
- 1897 Dr. C. A. Peters, Amherst, Mass.
- 1898 W. S. Fisher, Peace St. Grammar School, Providence, R. I.
- 1899 D. A. Beaman, Rio Piedras, Porto Rico.
- 1900 E. K. Atkins, 15 Hubbard Ave., Northampton, Mass.
- 1901 J. H. Chickering, Dover, Mass.
- 1902 H. L. Knight, 1420 Buchanan St., Washington, D. C.
- 1903 G. D. Jones, North Amherst, Mass.
- 1904 P. F. Staples, East Holliston, Mass.
- 1905 A. D. Taylor, 1900 Euclid Ave., Cleveland, Ohio.
- 1906 Richard Wellington, 2214 Scudder St., St. Paul, Minn.
- 1907 Clinton King, 31 Elm St., Springfield, Mass.
- 1908 S. J. Wright, 39 Wall St., Norwalk, Ct.
- 1909 O. B. Briggs, 1011 Fidelity Bldg., Baltimore, Md.
- 1910 Dr. F. L. Thomas, Auburn, Ala.
- 1911 L. M. Johnson, Newtown, Ct.
- 1912 F. S. Madison, East Greenwich, R. I.
- 1913 B. W. Ellis, 575 Main St., South Weymouth, Mass.
- 1914 L. Ernest Smith, Colchester, Ct.
- 1915 P. F. Whitmore, Sunderland, Mass.

SECRETARIES OF ALUMNI ORGANIZATIONS

Alumni Secretaries Association of the Massachusetts Agricultural College. Secretary—Ralph J. Watts, 1907, Amherst, Mass.

Associate Alumni of the Massachusetts Agricultural College. Secretary—Dr. Charles A. Peters, 1897, Amherst, Mass.

Connecticut Valley Association of the Massachusetts Agricultural College. Secretary—Robert S. Fay, 1913, Monson, Mass.

Massachusetts Agricultural College Club of Connecticut. Secretary—Herbert J. Baker, 1911, Storrs, Ct.

Massachusetts Agricultural College Club of Hawaii. President—Allen M. Nowell, 1897, 2013 McKinley St., Honolulu, T. H.

Massachusetts Agricultural College Club of Marlboro. Secretary—William L. Howe, 1908, Marlboro, Mass.

Massachusetts Agricultural College Alumni Club of Massachusetts. Clerk—Edward C. Edwards, 1914, 50 State St., Boston, Mass.

Massachusetts Agricultural College Club of New York, founded 1886. Meets second Saturday in November, Manhattan Hotel. Secretary—John Ashburton Cutter, M.D., 1882, 266 West 77th St., New York, N. Y.

Massachusetts Agricultural College Pacific Coast Alumni Association. Secretary—Thomas F. Hunt, 1905, Berkeley, Cal.

Massachusetts Agricultural College Club of Washington, D. C. Secretary—Dr. William A. Hooker, 1899, 223 Willow Ave., Takoma Park, D. C.

Massachusetts Agricultural College Club of Worcester County. Secretary—Charles H. White, 1909, 11 Foster St., Worcester, Mass.

Western Alumni Association of the Massachusetts Agricultural College. Secretary—Charles A. Tirrell, 1906, 815 Steinway Hall, Chicago, Ill.

MASSACHUSETTS AGRICULTURAL COLLEGE ADDRESS LIST

* Before the name denotes deceased.

1871

E. E. THOMPSON, *Secretary.*

- Allen, Gideon H., K Σ, 176 Court St., New Bedford, Mass. Business address, 693 Purchase St., New Bedford, Mass. Accountant and writer.
- Bassett, Andrew L., Q.T.V., 352 Decatur St., Brooklyn, N. Y. Business address, New Pier, 29 East River, New York City. Transfer agent Central Vermont Railroad Co.
- Birnie, W. P., K Σ, 34 Stearns Terrace, Springfield, Mass. Business address Birnie Paper Co., Springfield, Mass. Manufacturer.
- *Bowker, William H. Died January 4, 1916, at Boston, Mass.
- Caswell, Lilley B., 1269 Main St. Business address, 386 Main St., Athol, Mass. Civil Engineer.
- Cowles, Homer L., Amherst, Mass. Farmer.
- *Ellsworth, Emory A., Q.T.V. Died December 8, 1915, at Holyoke, Mass.
- Fisher, Jabez F., K Σ, 73 Congress St., Fitchburg, Mass. Accountant.
- *Fuller, George E. Supposed to have died about 1885.
- *Hawley, Frank W. Died October 28, 1883, at Belchertown, Mass.
- *Herrick, Frederick St. C., D.G.K. Died January 19, 1894, at Lawrence, Mass.
- Leonard, George B., D.G.K., 30 Avon Place, Springfield, Mass. Lawyer, Clerk of Courts, LL.B.
- Lyman, Robert W., Q.T.V., Northampton, Mass. Business address, 142 S. West St., Carlisle, Pa. Professor of Law, Dickinson Law School, Carlisle, Pa.; LL.B., Boston University, 1879; LL.M., Boston University, 1912; D.C.L., Yale University, 1913.
- *Morse, James H. Died June 21, 1883, at Salem, Mass.
- Nichols, L. A., K Σ, 6054 Woodlawn Ave., Chicago, Ill. Business address, 6231 Cottage Grove Ave., Chicago, Ill. Consulting Engineer. President, Chicago Steel Tape Co.
- *Norcross, Arthur D., D.G.K. Died February 13, 1916, at Monson, Mass.
- *Page, Joel B., D.G.K. Died August 23, 1902, at Conway, Mass.
- Richmond, S. H., 401 Burdine Block, Miami, Fla. Real Estate.
- Russell, William D., Φ K Φ, D.G.K., 353 W. 85th St., New York, N. Y. Manufacturer.
- Smead, Edwin B., Q.T.V., P. O. Box 335, Hartford, Ct. Principal, Watkinson Farm School.
- Sparrow, Lewis A., Northboro, Mass. Farmer.
- Strickland, George P., D.G.K., Parkland, Wash. Farmer.
- Thompson, Edgar E., 5 Jaques Ave., Worcester, Mass. Principal, Sever St.-Winslow St. Grammar Schools.
- *Tucker, George H. Died October 1, 1899, at Spring Creek, Pa.
- Ware, Willard C., Hamilton, Mass. Retired.
- Wheeler, William, Φ K Φ, K Σ, 14 Beacon St., Boston, Mass. Consulting Engineer. Trustee, M. A. C.
- *Whitney, Frank L., D.G.K. Died July 15, 1912, at Harvard, Mass.
- Woolson, George C., Hastings-on-Hudson, N. Y. Importer, Dealer and Grower, Nursery Stock.

NON-GRADUATES

- Barrows, William, Jr. Address unknown.
 Bell, George H. Address unknown.
 *Blunt, Charles E. Died in 1903.
 Brainard, John W., 49 Converse St., Palmer, Mass. Contractor and Builder.
 *Breck, Webster. Died March 4, 1878, at Newton, Mass.
 Brown, Clarence E., 53 Center St., Northampton, Mass. Electroplater.
 *Cary, William H. Died January 7, 1873, at Amherst, Mass.
 *Casey, Michael F. Died December 5, 1892, at Mount Vernon, N. Y.
 Cole, Daniel P. Address unknown.
 Crocker, Loring, Jr., 4 West Cedar St., Boston, Mass. Business address, 53 State St., Boston, Mass. Bond Broker.
 Eastman, George H., Storm Lake, Iowa. Abstracter. Member City Council.
 Graves, George G., 50 Marcella Ave., Pittsfield, Mass. Poultry husbandman.
 Greene, William H., 418 Jefferson Ave., Pomona, Cal. Retired.
 Gunn, Charles B., 1002 N. Corona St., Colorado Springs, Col. Retired.
 *Hall, Frederick A. Died August 31, 1869, at Amherst, Mass.
 *Hall, Lemuel W. Died March 18, 1910, at Lowell, Mass.
 Howland, Charles M., c/o Dr. De Ruyter Howland, Stratford, Ct.
 *Hubbard, Francis H. Died January 16, 1876, at San Francisco, Cal.
 *Kelleher, David W. Reported dead in 1873.
 King, Albert, 10 Belmont St., Taunton, Mass. Cashier, Taunton Ice Company.
 Luther, Gardiner C., 12 Sheldon St., Providence, R. I. Contractor.
 *Miller, Henry L. Died June 25, 1913.
 Nash, Edwin D., Bocas del Toro, Panama.
 Rankin, Austin B., 873 Harris Ave., Woonsocket, R. I. Wholesale Beef and Provision Dealer.
 *Slattery, William, Jr. Died July 22, 1899, at Northampton, Mass.
 *Southwick, Alonzo L. Died in 1913.
 Swift, George A., 21 Craft St., Waltham, Mass. Retired.
 Tucker, Wilson M., Monson, Mass.
 *Wheeler, Charles A. Died January, 1888, at Ouray, Col.
 Williams, Henry. Address unknown.

1872

F. E. KIMBALL, *Secretary.*

- Bell, Burleigh C., D.G.K., 824 Kearny St. Business address, 289 Eighth St., San Francisco, Cal. Druggist.
 Brett, William F., D.G.K., 40 Warren St., Dorchester, Mass. Retired.
 Clark, John W., Q.T.V., North Hadley, Mass. Fruit Grower.
 Cowles, Frank C., 31 Grand St., Worcester, Mass. Civil Engineer.
 *Cutter, Dr. John C., D.G.K. Died February 2, 1909, at Worcester, Mass.
 *Dyer, Edward N. Died March 17, 1901, at Holliston, Mass.
 *Easterbrook, Isaac H. Died May 27, 1901, at Dudley, Mass.
 *Fiske, Edward R., Q.T.V. Died October 31, 1913, at Germantown, Pa.
 Flagg, Charles O., Q.T.V., Abbottrun, R. I. Farmer.
 Grover, Rev. Richard B., West Newbury, Mass. Clergyman. Andover Theological Seminary, 1881.
 *Holmes, Judge Lemuel Le B., Q.T.V. Died August 4, 1907, at Mattapoisett, Mass.
 Howe, Edward G., 10233 S. Wood St., Chicago, Ill. Teacher in Englewood High School.
 Kimball, Francis E., 17 Harvard St., Worcester, Mass. Retired.
 *Livermore, R. W., Q.T.V. Died April 21, 1914.
 *Mackie, Dr. George, Q.T.V. Died August 31, 1906, at Attleboro, Mass.
 Maynard, Samuel T., Northboro, Mass. Fruit Grower and Farmer.
 Morey, Herbert E., 34 Hillside Ave., Malden, Mass. Business address, 36 Portland St., Boston, Mass. Coin, Medals, and Stamp dealer. A.B., P. O. Officials of Boston, 1915.
 *Peabody, William R., Q.T.V. Died June 28, 1908, at St. Louis, Mo.

*Salisbury, Frank B., D.G.K. Died 1895, in Mashonoland, Africa.
 Shaw, Elliot D., 130 Firglade Ave. Business address, 244 Main St., Springfield, Mass. Real Estate.
 Snow, George H., Leominster, Mass. Farmer.
 *Somers, Frederick M., Q.T.V. Died February 2, 1894, at Southampton, England.
 Thompson, Samuel C., Φ K Φ , Φ Σ K, 2348 University Ave., New York, N. Y. Civil Engineer.
 *Wells, Henry, Q.T.V. Died September 19, 1907, at Jamestown, R. I.
 Whitney, William C., Q.T.V., 2412 Harriet Ave. Business address, 313 Nicollet Ave., Minneapolis, Minn. Architect.

NON-GRADUATES

Ames, William C., Q.T.V., North Stoughton, Mass.
 Bancroft, Jonathan F., R. F. D. No. 2, Nashua, N. H. Farmer.
 Barber, Strong Hayden, Windsor, Ct. Real Estate.
 Barker, Charles A., 2 Hubbard St., Concord, Mass. Retired.
 Barreto, E. Fiuza. Address unknown.
 *Blankinship, Edwin A. Died March 5, 1889, at Brockton, Mass.
 Blood, Alonzo H. Address unknown.
 Bullard, Dr. William E., Larchmont, N. Y. Physician.
 *Chapman, Edward B. Died at Jersey City. Date unknown.
 Codina, Gabriel. Address unknown.
 Cows, Walter D., North Amherst, Mass. Farmer.
 Harrington, Frank W., North Amherst, Mass. Employed at M. A. C. Carpenter Shop.
 Kingman, William H., 5 Market St., Springfield, Mass.
 *Lester, Frank H., Q.T.V. Died November 13, 1874, at Central Village, Ct.
 *Lockey, John M., Q.T.V. Died September 28, 1915.
 Morris, Frederick W., 71 East 92d St. Business address, 542 Fifth Ave., New York, N. Y. Bookseller.
 Naito, Saitaro. Address unknown.
 Nash, Arthur H. Address unknown.
 *Ober, Frederick A. Died May 31, 1913.
 Penhallow, Charles L. Address unknown.
 Smith, William H. Stafford Springs, Ct. Plumber.
 Swazey, Dr. Walter W., 43 Sherman St. Business address, 25 Harrison Ave., Springfield, Mass. Dentist. D.D.S., 1890.
 Thomas, George H., Leonard Bridge, Ct. Farmer.
 *Vose, Dr. Edward F. Died January, 1911, at Portland, Me.
 *West, Frank H. Died January 12, 1904, at Haverhill, Mass.
 *Wills, John W. Supposed to be dead.

1873

DR. CHARLES WELLINGTON, *Secretary.*

Eldred, Frederick C., Sandwich, Mass. Cranberry Grower.
 Leland, Walter S., D.G.K., Concord Junction, Mass. Officer in Massachusetts Reformatory.
 *Lyman, Asahel H., D.G.K. Died January 16, 1896, at Manistee, Mich.
 Mills, Dr. Geo. W., 60 Salem St., Medford, Mass. Physician. M.D. Harvard, 1879.
 Minor, John B., Φ K Φ , Q.T.V., New Britain, Ct. Manufacturer.
 *Penhallow, Professor David P., Q.T.V. Died at sea, October, 1910.
 *Penshaw, James B. Deceased.
 Simpson, Henry B., Q.T.V., 2709 Wisconsin Ave., N. W., Washington, D. C.
 Wakefield, Dr. Albert T., Sheffield, Mass. Physician. M.D. Jefferson Medical College, 1878.
 Warner, Seth S., K Σ , Florence, Mass., Farmer.
 Webb, James H., Φ K Φ , K Σ , Hamden, Ct. Business address, County Court House, New Haven, Ct. Judge of Superior Court, Ct. LL.B., Yale University, 1877.

Wellington, Dr. Charles, $\Phi K \Phi$, $K \Sigma$, Amherst, Mass. Professor of Chemistry,
M. A. C. Ph.D. Göttingen, Germany, 1885.
Wood, Frank W. Address unknown.

NON-GRADUATES

*Avery, Frank R. Died June 2, 1886.
Bailey, Jonathan. Address unknown.
Baker, Frederick W., Ventura, Cal.
Barrows, Fletcher K., 47 High St., Brattleboro, Vt. President Brattleboro Savings
Bank.
Capen, Dr. Thomas A., 852 Pleasant St., Fall River, Mass.
*Carter, Herbert M. Died February 22, 1888, at Winchester, Mass.
Childs, William F., 1411 Davis St., Evanston, Ill.
Clark, William J., 113 Franklin Ave., Salem, Ohio. Manufacturer.
Cleland, William F., 96 West Central St., Natick, Mass. Business address, 9 Main
St., Natick, Mass. Merchant.
Colby, Daniel T. Address unknown.
Cooke, Charles M. Address unknown (1915). Honolulu, H. I. (1897).
Copp, Belton A., Groton, Ct. Business address, New London, Ct. Banker.
Damon, Edward C. Address unknown (1915). Honolulu, H. I. (1897).
*Flower, Archibald D. Died 1914 or 1915.
Frisbie, George B., D.G.K. Address unknown.
Furness, George A., D.G.K. Address unknown.
Garrett, William E. Address unknown.
Healey, George C., Hampton Falls, N. H. Farmer.
Johns, Dr. Frederick D., Q.J.V., 4616 McPherson Ave., St. Louis, Mo.
*Lathrop, Joseph D. Died March 29, 1888, at Spokane, Wash.
Lovell, Frank K. Address unknown.
Mines, William W. Address unknown.
Phelps, John C., Bradford, Ill.
Rowland, Charles W. Address unknown.
*Sanderson, Charles F. Died September 13, 1870, at Petersham, Mass.
Sanderson, Robert W., 136 Lincoln St., Holyoke, Mass. Grocer.
Smith, Jasper B. Address unknown.
Smith, William O. Address unknown (1915). Honolulu, H. I. (1897).
Warriner, Alfred A., Warren, Mass. Dairy and Fruit Farmer.

1874

D. G. HITCHCOCK, *Secretary.*

Benedict, Dr. John M., D.G.K., "Elmdale," Woodbury, Ct. Retired. M.D.
University of the City of New York, 1882.
Blanchard, William H., 5 Guernsey Ave., Montpelier, Vt. Botanist and Genealogist.
Chandler, Edward P., D.G.K., Rogue River, Ore. Fruit Grower.
*Curtis, Woolfred F. Died November 18, 1878, at Westminster, Mass.
*Dickinson, Asa W. Died November 8, 1899, at Easton, Pa.
Hitchcock, Daniel G., Warren, Mass. Insurance.
Hobbs, John A., R. F. D. No. 1, Cornelius, Ore. Dairy and Fruit Farmer.
Libby, Edgar H., $\Phi K \Phi$, 929 Union Oil Building, Los Angeles, Cal. Agricultural
Engineer.
*Lyman, Henry. Died January 19, 1879, at Middlefield, Ct.
Montague, Arthur H., South Hadley, Mass. Farmer.
*Phelps, Henry L. Died March 3, 1900, at West Springfield, Mass.
*Smith, Frank S., D.G.K. Died December 24, 1899, at Cleveland, Ohio.
*Woodman, Edward E. Died November 20, 1912, at Danvers, Mass.
Zeller, Harrie M., 910 Cedar St., Hagerstown, Md. Fruit Grower.

NON-GRADUATES

- Adams, Fred E., 350 Fulton St., Brooklyn, N. Y. Lumber Dealer.
 Alexander, Edward P., Q.T.V., Pacific Hotel, Jacksonville, Ill. Assistant Manager, Hotel.
 *Annable, Robert W. Died March 14, 1878, at Portsmouth, N. H.
 Ariail, Smith. Address unknown.
 Babbitt, George H. T., General Electric Company, Pittsfield, Mass. Accountant. Graduated U. S. N. A., 1875.
 Barstow, William H., 189 Parkway, Winchester, Mass. Real Estate and Investments.
 *Bliss, A. N. Died, 1913, at Akron, Ohio.
 Briggs, Louis W., Plaquemine, La.
 Clark, Wallis O., c/o American Legation, Guatemala, C. A. Retired Major, U. S. A.
 *Clark, William Avery. Died May 23, 1872, at Springfield, Mass.
 Doubleday, Henry M., D.G.K. Address unknown.
 Doubleday, William H., D.G.K. Address unknown.
 Duncan, Geo. Adams. Address unknown.
 *Fisk, Charles A. Died July 30, 1904.
 *French, John L. Died September 25, 1883, at East Boston, Mass.
 Gillett, Edward, Q.T.V., Southwick, Mass. Nurseryman.
 *Hardy, Edward E., Q.T.V. Died October 12, 1903, at Auburndale, Mass.
 Heyl, J. E., 421 Chestnut St., Philadelphia, Pa.
 Johns, Arthur C., Q.T.V. Address unknown.
 *Lyman, William. Died December 20, 1896, at Middelfield, Ct.
 *Millard, David K. Died May 30, 1875. Drowned in Connecticut River.
 Mitchell, William H. Address unknown.
 Moody, George F. Address unknown.
 Ould, Remus. Address unknown.
 Pearce, Walter S. Address unknown.
 Post, Dr. Henry W. Address unknown.
 Shaw, Charles J. Address unknown.
 Smith, James Metcalf, 7 Parkis Ave., Providence, R. I. Steam and Water Heating Factory Superintendent.
 Smith, John B. Address unknown.
 Strain, William, Q.T.V., Mt. Carmel, Ct.
 *Towne, Frank A. Died March 11, 1896, at Dansville, N. Y.
 *Tucker, Charles E. Died August 27, 1880, at Dijon, France.
 Watkiss, James E., Hammonton, N. J. Florist.
 Zeller, Bruce S., Q.T.V., 502 Summit Ave., Hagertown, Md. Real Estate.
 Zeller, William M., Q.T.V., R. D. No. 2, Santa Barbara, Cal.

1875

P. M. HARWOOD, *Secretary*.

- Barrett, Joseph F., Φ K Φ , Φ Σ K, 473 W. 158th St. Business address, 60 Trinity Place, New York City. Fertilizer business.
 Barri, John A., 346 Maple St., Springfield, Mass. Business address, c/o Berkshire Mill, Bridgeport, Ct. Grain and Coal dealer.
 Bragg, Everett B., Q.T.V., 1838 Chicago Ave., Evanston, Ill. Business address, 112 West Adams St., Chicago, Ill. Vice President and Western Manager, General Chemical Co.
 Brooks, William P., Φ K Φ , Φ Σ K, Amherst, Mass. Director and Agronomist, Massachusetts Agricultural Experiment Station. Ph.D, 1897, Halle, Germany.
 Bunker, Madison. Died January 16, 1916, at Newton, Mass.
 Callender, Thomas R., D.G.K., Northfield, Mass. Farmer.
 Campbell, Frederick G., Φ Σ K, Putney, Vt. Farmer and Stock Raiser.
 Carruth, Herbert S., D.G.K., Amherst, Mass. Retired.
 *Clark, Zenos Y. Died June 4, 1889, at Amherst, Mass.
 *Clay, Jabez W. Died October 1, 1880, at New York, N. Y.

Dodge, George R., Q.T.V., South Hamilton, Mass. Farmer.
 *Hague, Rev. Henry, $\Phi \Sigma K$. Died April 25, 1914.
 Harwood, Peter M., $\Phi \Sigma K$, Barre, Mass. Business address, Room 136, State House, Boston, Mass. General Agent, Massachusetts Dairy Bureau.
 *Knapp, Walter H., $\Phi K \Phi$. Died April 10, 1911, at Newtonville, Mass.
 Lee, Lauren K., 2072 Iglehart Ave. Business address, Dispatch Building, St. Paul, Minn. General Advertising Agency.
 Miles, George M., First National Bank, Miles City, Montana. Banker and Merchant.
 Otis, Harry P., K Σ , Florence, Mass. Manufacturer.
 Rice, Frank H., 710 Madison St., Oakland, Cal. Accountant.
 Southwick, Andre A., $\Phi \Sigma K$, 355 Tremont St., Taunton, Mass. Farmer.
 Winchester, Dr. John F., Q.T.V., East Haverhill St., Lawrence, Mass. Veterinarian D.V.S., American Veterinary College, New York, 1878.

NON-GRADUATES

*Andrae, George C., Q.T.V. Deceased.
 *Ashton, John. Deceased.
 Bardwell, Daniel P., Q.T.V., Bardwell's Ferry, Mass.
 Carter, Samuel M., Q.T.V., R. F. D. No. 1, Templeton, Mass.
 Chase, Edmund Taylor. Address unknown.
 Clark, Lysander. Address unknown.
 Cowles, Elliot A. Address unknown.
 *Deland, Thomas J. Died November 7, 1873, at Boston, Mass.
 Dix, James Q., Q.T.V., Holden, Mass.
 Eaton, Harry, Elbowoods, N. Dak.
 Ellis, Granville Alden. Address unknown.
 Ely, William I., Freehold, N. J., R-4-Box 339.
 *Frothingham, Thomas G., D.G.K. Died January 21, 1911, at N. Attleboro, Mass.
 *Garrigues, Samuel S. Died May 16, 1889, at Ann Arbor, Mich.
 *Gibbs, Charles F. Died at Thetford, Vt., shortly after leaving College.
 Graves, L. B. Address unknown.
 Hatch, George S., Medford, Mass. Business address, Room 236, State House, Boston, Mass.
 Holmes, Harry H., 621 Cypress Ave., Pasadena, Cal. Business address, Room 201, 14 North Fair Oakes Ave., Pasadena, Cal.
 Jackson, Henry S., Q.T.V., 516 Park Ave., East Orange, N. J. Retired.
 *Judkins, Arthur M. Deceased.
 *King, John E. Died September 26, 1881, at South Norwalk, Ct.
 Kinsman, Willard F., D.G.K., 168 High St., Ipswich, Mass. Farmer.
 Lyman, A. W., 1553 Riverdale St., Chicopee, Mass. Salesman.
 Lyon, William S. Address unknown.
 Merrill, James C., 1 Cushing Ave., Haverhill, Mass.
 Merrill, Nathaniel P., North Wilbraham, Mass.
 Mildeberger, Christopher V., Parkville, L. I., N. Y. Farmer.
 Newman, Charles V. Address unknown.
 Nomura, Ichiskay. Address unknown.
 *Parker, Francis G. Deceased.
 Peabody, Cecil H., M.I.T., Boston, Mass. Professor of Naval Architecture and Marine Engineering. S.B., M.I.T., 1877.
 *Platt, William D. Died in December, 1914.
 Player, Harry H., Q.T.V. Address unknown.
 *Reed, Freemont S., Q.T.V. Died July 4, 1879, at South Weymouth, Mass.
 Rotch, Rev. Caleb L., Sherburn, Minn. Clergyman.
 Sanger, Herbert C. Address unknown.
 Snow, Laban, Harwichport, Mass.
 Stearns, Richard S., D.G.K., Rockwood St., Jamaica Plain, Mass.
 *Taylor, Ralph I. Deceased.
 Thomas, John L. Address unknown.
 *Vaill, William H. Deceased.
 *Weeks, Herman F. Died while in College.

Wright, Augustus H. Address unknown.
Yamao, Tenataro. Address unknown.
Youchi, Geamon. Address unknown.

1876

C. FRED DEUEL, *Secretary*:

Bagley, David A. Address unknown.
Bellamy, John, D.G.K., 19 Mallon Rd., Dorchester, Mass. Business address, 134 Pearl St., Boston, Mass. Assistant Treasurer Atlantic Coast Hardware Co.
Chickering, Darius O., Enfield, Mass. Farmer.
Deuel, C. Fred, Φ K Φ , Q.T.V., Amherst, Mass. Druggist.
*Guild, George W., Q.T.V. Died May 8, 1903, at Jamaica Plain, Mass.
Hawley, Joseph M., D.G.K. Address unknown.
*Kendall, Hiram, D.G.K. Died in 1911 at East Greenwich, R. I.
Ladd, Thomas H. Address unknown.
*Macleod, William A., Φ K Φ , D.G.K. Died November 4, 1913.
Mann, George H., 68 Stoughton Ave., Readville, Mass. Engineer.
Martin, William E., 917 W. 12th St., Sioux Falls, S. D. Bookkeeper.
McConnel, Dr. Charles W., K Σ , 171 Tremont St., Boston, Mass. Dentist, D.D.S., Philadelphia Dental College, 1880.
Parker, George A., Φ K Φ , Φ Σ K, 100 Blue Hills Ave., Hartford, Ct. Superintendent of Parks.
Parker, George L., D.G.K., 807 Washington St., Dorchester, Mass. Florist.
Phelps, Charles H. Address unknown.
Porter, William H., Φ Σ K, Agawam, Mass. Farmer.
Potter, William S., D.G.K., 920 State St., Lafayette, Ind. Lawyer and Banker.
Root, Dr. Joseph E., Φ Σ K, 67 Pearl St., Hartford, Ct. Orthopedic Surgeon. M.D., College of Physicians and Surgeons, New York, 1883.
*Sears, John M. Died April 3, 1915.
*Smith, Thomas E., D.G.K. Died September 20, 1901, at West Chesterfield, Mass.
*Taft, Cyrus A. Died February 7, 1908, at Whitinsville, Mass.
*Urner, George P., D.G.K. Died April, 1897, at Wisley, Mont.
*Wetmore, Howard G., D.G.K. Died April 27, 1906, at New York, N. Y.
*Williams, John E. Died January 18, 1890, at Amherst, Mass.

NON-GRADUATES

*Carter, Walter E. Reported dead.
Clark, Charles T. Address unknown.
Cook, Rufus L., Hadley, Mass.
DePew, Richard M., D.G.K. Address unknown.
Ellis, Edward S., Bourne, Mass.
Greene, Frank B., R. F. D. No. 1, Amherst, Mass.
Hadwen, William E. Address unknown.
Hobbs, Joseph O., North Hampton, N. H.
Jefts, Melvin W., Ashby, Mass. Farmer.
Judd, Charles A., South Hadley Falls, Mass. Farmer.
Lawton, Charles F., Q.T.V., Box 583, New Bedford, Mass. Forester.
Leach, Frank H., 728 Main St., Worcester, Mass.
Merriam, J. H. Address unknown.
Parker, Edward H. Address unknown.
*Perkins, William H. Died in 1897, at Watertown, Mass.
Preston, Edward G., Box 147, Port Tampa City, Fla.
Robinson, J. Albert, 11 Marion Rd., Arlington, Mass. Business address, Washington Square, Brookline, Mass. Real Estate and Insurance.
Rogers, Mulford T., 70 Fifth Ave., New York, N. Y.
Sanger, Frank H., 17 Boyd St., Newton, Mass.
*Slade, Denison R., D.G.K. Died June 17, 1914.
Spooner, Frank A., 104 Mount Auburn St., Watertown, Mass. Sales Manager.

Swift, Frank M., Q.T.V., Provincetown, Mass. Railway Postal Clerk.
 Tucker, Fred H., 206 Church St., Newton, Mass. Business address, 141 Essex St.,
 Boston, Mass. Wholesale Dry Goods.

1877

ATHERTON CLARK, *Secretary.*

Benson, David H., Q.T.V., 419 Georgia St., Jacksonville, Fla.
 Brewer, Charles. Address unknown.
 Clark, Atherton, Φ K Φ , K Σ , 231 Waverly Ave., Newton, Mass. Business address,
 140 Tremont St., Boston, Mass. Merchant.
 *Hibbard, Joseph R. Died June 17, 1899, at Stoughton, Wis.
 Howe, Waldo V., Q.T.V., Newburyport, Mass. Farmer.
 Mills, James K., K Σ , Amherst, Mass. Photographer.
 Nye, George F., D.G.K. Address unknown.
 *Parker, Henry F. Died December 21, 1897, at Brooklyn, N. Y.
 Porto, Raymundo M. Da, Φ Σ K, Para, Brazil.
 *Southmayd, John E., Φ Σ K. Died December 11, 1878, at Minneapolis, Minn.
 Wyman, Joseph, 347 Massachusetts Ave., Arlington, Mass. Real Estate.

NON-GRADUATES

*Ball, Gilman K., Q.T.V. Died February, 1905.
 Bond, Henry. Address unknown.
 *Dickinson, Captain Walter M., Q.T.V. Killed at Battle of El Caney, Cuba, 1898.
 Goodrich, Wilbur F. Address unknown.
 *Gunn, William B. Died November 22, 1913.
 Mallory, West A., R. F. D. No. 1, Cadott, Wis.
 Moore, Frank L. Address unknown.
 Nakashima, Masanogio. Address unknown.
 Paige, Harry C. Address unknown.
 *Palmer, Frank W. Died 1877, at Amherst, Mass.
 Pixley, Martin S., 23 Woodside Terrace, Springfield, Mass. Janitor.
 *Smith, Frank L. Died February 16, 1876, at Springfield, N. Y.
 *Southworth, Charles H., Q.T.V. Deceased.
 Urner, Frank G., 173-175 Chambers St., New York, N. Y. Editor.
 *Wayesugi, Tall Katuyoshi. Deceased.
 Wilson, Hon. Alvin R., South Hadley, Mass. Representative, Massachusetts General
 Court, 1915-1916.

1878

C. O. LOVELL, *Secretary.*

Baker, Dr. David E., Φ Σ K, 227 Walnut St., Newtonville, Mass. Physician. M.D.,
 Harvard, 1883.
 *Boutwell, Willis L. Died September 28, 1906, at Northampton, Mass.
 Brigham, Dr. Arthur A., Φ Σ K, Brinklow, Md. Farmer, Ph.D., Göttingen, 1896.
 *Choate, Edward C., Q.T.V. Died January 18, 1905, at Southboro, Mass.
 *Coburn, Charles F., Q.T.V. Died December 26, 1901, at Lowell, Mass.
 Foot, Sanford D., Q.T.V., 231 West 70th St., New York, N. Y. Business address,
 Nicholson File Company, Paterson, N. J. Manufacturer.
 Hall, Dr. Josiah N., Φ K Φ , Φ Σ K, 1344 Elizabeth St. Business address, 452 Metro-
 politan Building, Denver, Col. Physician. M.D., Harvard, 1882.
 Heath, Henry G. K., D.G.K., 35 Nassau St., New York, N. Y. Lawyer.
 Howe, Dr. Charles S., Φ K Φ , Φ Σ K, 11125 Bellflower Rd., Cleveland, Ohio. President
 Case School of Applied Science. Ph.D., Wooster University, 1887;
 D.Sc., Armour Institute, 1905; LL.D., Mt. Union College, 1908.
 Hubbard, Henry F., Q.T.V., 37 Elm Grove Ave. Business address, 26 Custom House
 St., Providence, R. I. Tea Importer.

Hunt, John F., 302 Ferry St., Malden, Mass. Business address, 27 State St., Boston, Mass. Building Superintendent.
 Lovell, Charles O., Q.T.V., 201 Darke Block, Regina, Sask., Canada. Photographer.
 Lyman, Charles E., Middlefield, Ct. Farmer.
 Myrick, Lockwood, Hammonton, N. J. In State Hospital.
 *Osgood, Frederick H., Q.T.V. Died February 22, 1914, at Allston, Mass.
 *Spofford, Amos L., $\Phi \Sigma K$. Died in 1911.
 Stockbridge, Dr. Horace E., K Σ , Atlanta, Ga. Editor *Southern Ruralist*. Ph.D. Göttingen, 1884.
 Tuckerman, Dr. Fredrick, Q.T.V., Amherst, Mass. Anatomist. M.D., Harvard, 1882; M.A. and Ph.D., University of Heidelberg, Germany, 1894.
 Washburn, Dr. John H., K Σ , Farm School, Pa. Director, National Farm School. Ph.D., Göttingen, Germany.
 Woodbury, Rufus P., Q.T.V., Cordova Hotel, Kansas City, Mo. Business address, Live Stock Exchange Building, Kansas City, Mo. Secretary, The Kansas City Live Stock Exchange.

NON-GRADUATES

Allen, Matthew J. Address unknown.
 Augur, Charles P., $\Phi \Sigma K$, Middlefield, Ct. Orchardist.
 *Carneiro, Manuel D., $\Phi \Sigma K$. Died in 1897.
 *Carvallo, William, Q.T.V. Deceased.
 Collum, George N. Address unknown.
 *Cooley, Silas R. Died November 13, 1901.
 *Darling, Ira C. Died July 21, 1891, at Pawtucket, R. I.
 *Davis, George B. Died March 10, 1894, at West Stafford, Ct.
 Franco, Eugenio deL. Address unknown.
 Goss, Frank W. Address unknown.
 *Humphrey, George E., D.G.K. Died September 23, 1898, at Rutland, Vt.
 Koch, Henry G. H. See Heath.
 Loomis, Francis E., Lincoln Ave., Amherst, Mass. Farmer.
 Morey, Guy, D.G.K., 46 Mt. Washington St. Business address, 63 Market St., Lowell, Mass. Assistant Treasurer, C. B. Coburn Co.
 Nims, Luther, Mt. Holly, N. C. Farmer and Manufacturer.
 Taylor, Henry M., 6 Beacon St., Boston, Mass. Real Estate.
 Walker, James B. Address unknown.

1879

DR. R. W. SWAN, *Secretary*.

Dickinson, Richard S., K Σ , Columbus, Neb. Banker.
 *Green, Samuel B., K Σ . Died July 11, 1910.
 Rudolph, Charles, Q.T.V., Hotel Rexford, Boston, Mass.
 Sherman, Dr. Walter A., D.G.K., 214 Pawtucket St. Business address, 340 Central St., Lowell, Mass. Veterinary Surgeon. Inspector of Animals for City of Lowell. D.V.S. 1882, American Veterinary College; M.D., 1883, Long Island Medical College.
 Smith, George P., K Σ . Sunderland, Mass. Farmer.
 Swan, Dr. Roscoe W., D.G.K., 41 Pleasant St., Worcester, Mass. Physician.
 Waldron, Hiram E. B., Q.T.V., 112 Highland St. Business address, 1202 River St., Hyde Park, Mass. Real Estate and Fire Insurance.

NON-GRADUATES

*Baker, Martin, $\Phi \Sigma K$. Died March 10, 1876, at Amherst, Mass.
 Bass, Edward L., Bethel, Vt. Lumber Dealer.
 Camargo, H. P. Address unknown.
 Campbell, Charles H., 1021 Third Ave., N. Business address, 9 Second St., N., Great Falls, Mont. Real Estate and Loans.
 Carey, Charles B. Address unknown.
 Chittenden, Edward W., Q.T.V., Bridgeport, Ct. Fertilizer Business.

Cook, Roland C. With Boody, McLellan & Co., Bankers, 111 Broadway, New York, N. Y.

*Damon, William F. Died October 23, 1879, at Honolulu, H. I.

Howard, Joseph C., West Bridgewater, Mass. Farmer.

*Hunt, Elisha H., $\Phi \Sigma K$. Deceased.

Knox, Ruben, Q.T.V. Address unknown.

*Lincoln, Joseph G. Died January 22, 1877, at Amherst, Mass.

Palmer, Coddington B. Address unknown.

Pierce, William A., $\Phi \Sigma K$, Chanute, Kansas.

Wadley, George D., D.G.K. Address unknown.

1880

A. L. FOWLER, *Secretary*.

Fowler, Alvan L., $\Phi \Sigma K$, 23 Estaugh Ave., Haddonfield, N. J. Business address, 413 Federal Bldg., Philadelphia, Pa. National Bank Examiner.

Gladwin, Frederick E., $\Phi \Sigma K$. Address unknown.

Lee, William G., D.G.K., 1408 O St., Sacramento, Cal. Draughtsman, with California Highway Commission.

McQueen, Charles M., $\Phi \Sigma K$. Address unknown.

Parker, William C., $\Phi \Sigma K$, 158 Huntington Ave. Business address, 811 Old South Building, 294 Washington St., Boston, Mass. Lawyer. LL.B., 1889, Boston University Law School.

Ripley, George A., Q.T.V., "The Wildwood," Jefferson, Mass. Farmer.

Stone, Almon H., Wareham, Mass. Farmer.

NON-GRADUATES

*Atwood, Dr. Horace W. Died September 1, 1903.

Bristol, Edwin F., Ascutneyville, Vt. Farmer.

Cary, Willis W., Fishkill, N. Y.

*Codman, Francis, Q.T.V. Died November 11, 1885, at Brookline, Mass.

*Endicott, George, Q.T.V. Died April 16, 1889, at New York, N. Y.

Goodale, E. T. Address unknown.

Hall, Alfred S., $\Phi \Sigma K$, 312 Malden St., Revere, Mass. Market Gardener.

Heighway, Dr. Sheridan C., Murphy, N. C. Physician.

Mattocks, Euao E. Address unknown.

Pease, Charles T. Address unknown.

Plaza, Enguerrando. Address unknown (1915). Valparaiso, Chile (1897).

Richardson, Benjamin P., 72 Broad St., Boston, Mass.

Stewart, William C., Q.T.V. Address unknown.

Townsley, Herbert M., Canton, N. Y. Civil Engineer.

Warner, Dr. William E., Q.T.V. Address unknown.

*Wing, Edgar R. Died October 17, 1880, at West Newton, Mass.

Wood, Louis, $\Phi \Sigma K$, Hope, Steele Co., N. D.

Zabriskie, Dr. Frank H., Q.T.V., 426 Main St., Greenfield, Mass. Physician. M.D., Columbia, 1883.

1881

DR. J. L. HILLS, *Secretary*.

Bowman, Charles A., C.S.C., 211 Maple St. Business address, 306 So. Salina St., Syracuse, N. Y. Civil Engineer.

*Boynton, Dr. Charles E. Died at Los Banos, Cal. Date unknown.

*Carr, Walter F., Q.T.V. Died February 2, 1916, at Seattle, Wash.

Chapin, Dr. Henry E., A $\Sigma \Phi$, 49 Lefferts Ave., Richmond Hill, New York, N. Y. Teacher of Biology and Physiology, M.Sc., Mich. Agri. College, 1893; D.Sc., McKendree College, 1908.

- Fairfield, Frank H., Q.T.V., 44 Broad St., New York, N. Y. Chemical Engineer. Stock Broker.
- *Flint, Charles L., Q.T.V. Died June, 1904.
- *Hashiguchi, Boonzo, D.G.K. Died August 12, 1903, at Tokyo, Japan.
- Hills, Dr. Joseph L., Φ K Φ , K Σ , 59 N. Prospect St., Burlington, Vt. Dean, College of Agriculture, University of Vermont. Director Vermont Agricultural Experiment Station. D.Sc., Rutgers College, 1903.
- Howe, Elmer D., Φ Σ K, Marlboro, Mass. Dairy Farmer. Trustee, M. A. C.
- Peters, Dr. Austin, Q.T.V., "Lane End," Harvard, Mass. Farmer and Veterinarian. D.V.S., American Veterinary College, New York, 1883; M.R.C.V.S., London, England, 1885.
- Rawson, Edward B., D.G.K., 11 Clifton Place, Brooklyn, N. Y. Business address 226 E. 16th St., New York, N. Y. Superintendent, Friends' Seminary. Pd.M., New York University, 1910.
- Smith, Dr. Hiram F. M., 115 S. Main St., Orange, Mass. Physician. M.D., Harvard, 1885.
- Spalding, Abel W., C.S.C., 914 Rialto Building, San Francisco, Cal. Contracting Engineer.
- Taylor, Frederick P., D.G.K., Athens, Tenn. Farmer.
- *Warner, Clarence D., D.G.K. Died October 16, 1905, at Kimmswick, Mo.
- *Whittaker, Arthur, D.G.K. Died in March, 1906, at Needham, Mass.
- *Wilcox, Henry H., D.G.K. Died at Honolulu, January 11, 1899.
- Young, Dr. Charles E., Φ Σ K, Glenwood, N. C. Resident Physician, Glenwood Park Sanatorium. M.D., University of the City of New York, 1882.

NON-GRADUATES

- Bissell, Charles H., Southington, Ct.
- Brooks, William C., D.G.K., Freedom, N. H. Civil Engineer and Farmer.
- Boncore, Lewis. Address unknown.
- *Clark, Wallace V., D.G.K. Died October 15, 1915.
- *Courtney, Matthew. Died April 25, 1891, at Brockton, Mass.
- Hall, Albert O., Φ Σ K, 134 Clark Ave., Chelsea, Mass.
- Hawley, Amasa S. Address unknown.
- *Hobbs, John F. Died August 27, 1881.
- *Howe, Winslow B., Φ Σ K. Died in 1911.
- Kenfield, Charles R. Address unknown.
- McKenna, James P., 48 Center St., New London, Ct. Superintendent Street Railways.
- Perry, Alfred D., Φ Σ K, 154 Vernon St., Worcester, Mass. Milk Dealer.
- Sattler, Herman C., 1207 Norfolk Ave., Norfolk, Neb. Dealer in Agricultural Implements.
- Smith, Benjamin S., Φ Σ K, 32 Nassau St., New York, N. Y.
- Smith, John L., K Σ , Barre, Mass. Farmer.
- Wolfe, Walter M. Address unknown.
- Wood, Wilbur, 2607 E. Pacific Ave., Spokane, Wash.

1882

G. D. HOWE, *Secretary*.

- Allen, Dr. Francis S., C.S.C., 221 Main St., Nashua, N. H. Veterinary Surgeon. Proprietor of "The Belgravia." D.V.S., American Veterinary College, New York, N. Y., 1884; M.D., New York University, 1886.
- Alpin, George T., Q.T.V., Putney, Vt. Farmer.
- Beach, C. Edward, D.G.K., West Hartford, Ct. Farmer.
- *Bingham, Eugene P. Died March 31, 1904, at Los Angeles, Cal.
- Bishop, William H., Φ Σ K, Farm School, Pa. Professor of Agriculture, National Farm School.
- *Brodt, Harry S., Q.T.V. Died December, 1906, at Rawlins, Wyo.
- Chandler, Rev. Everett S., C.S.C., R. D. No. 3, North Judson, Ind. LL.B., Harvard, 1885; B.D., Chicago Theological Seminary, 1890.

Cooper, James W., D.G.K., 142 Court St., Plymouth, Mass. Pharmacist.
 Cutter, Dr. John A., $\Phi \Sigma K$, 266 W. 77th St., New York City. Physician. M.D., Albany Medical College, 1886.
 Damon, Samuel C., C.S.C., Kingston, R. I. Assistant, Field Experiments, Rhode Island Agricultural Experiment Station.
 *Floyd, Charles W., D.G.K. Died October 10, 1883, at Dorchester, Mass.
 Goodale, David, Q.T.V., Marlboro, Mass. Farmer.
 Hillman, Charles D., $\Phi \Sigma K$, R. F. D. No. 2, Watsonville, Cal. Nurseryman.
 *Howard, Joseph H., $\Phi \Sigma K$. Died February 13, 1889, at Minnsela, S. D.
 Howe, George D., 38 Whittier Ave., Springfield, Mass. Traveling Salesman.
 Jones, Frank W., Q.T.V., Assinippi, Mass. Business address Hanover, Mass. Teacher.
 Kingman, Morris B., Amherst, Mass. Florist and Market Gardener.
 Kinney, Burton A., $\Phi \Sigma K$, 106 Chestnut Ave., Santa Ana, Cal.
 May, Frederick G., $\Phi \Sigma K$, Groton, Mass. Farmer.
 Morse, William A., Q.T.V., 15 Auburn St., Melrose Highlands, Mass. Business address 111 Devonshire St., Boston, Mass. Secretary.
 Myrick, Herbert, 151 Bowdoin St., Springfield, Mass. Business address Myrick Building, Springfield, Mass. Editor, Publisher, and Manufacturer. President Orange Judd Co., 315 Fourth Ave., New York, N. Y.
 Paige, Dr. James B., $\Phi K \Phi$, Q.T.V., 42 Lincoln Ave., Amherst, Mass. Professor of Veterinary Science, Massachusetts Agricultural College; Veterinarian, Massachusetts Agricultural Experiment Station. D.V.S., McGill University, 1888.
 Perkins, Dana E., 7 Kenwin Road, Winchester, Mass. Business address 457 Washington St., Winchester, Mass. Civil Engineer.
 Plumb, Prof. Charles S., Q.T.V., 1980 Indianola Ave., Columbus, Ohio. Professor of Animal Husbandry, Ohio State University, Columbus, Ohio.
 Shiverick, Asa F., $K \Sigma$, 1310 Madison Park. Business address, 33 North Wabash Ave., Chicago, Ill. Merchant.
 Stone, Dr. Winthrop E., C.S.C., 146 N. Grant St., Lafayette, Ind. President of Purdue University. Ph.D., Göttingen, Germany, 1888; LL.D., Michigan Agricultural College, 1907.
 Taft, Levi R., $\Phi K \Phi$, C.S.C., Agricultural College, East Lansing, Mich. State Superintendent Farmers' Institutes.
 Taylor, Alfred H., D.G.K. Address unknown.
 *Thurston, Wilbur H. Died August, 1900, at Cape Nome, Alaska.
 Wilder, John E., $\Phi K \Phi$, $K \Sigma$, 1211 Hinman Ave., Evanston, Ill. Business address 226-228 W. Lake St., Chicago, Ill. Tanner and Leather Merchant. Director National City Bank; President State Association, Illinois Y. M. C. A.'s; Trustee Beloit College.
 Williams, James S., Q.T.V., Glastonbury, Ct. Manufacturer.
 Windsor, Joseph L., 922 State Life Building, Indianapolis, Ind. Special Agent, Glens Falls Insurance Co.

NON-GRADUATES

Abercrombie, Fred N., $\Phi \Sigma K$, Room 1911, Harris Trust Building, 111 W. Monroe St., Chicago, Ill.
 Allen, George D., D.G.K., Vacaville, Cal. Fruit Grower.
 Brown, Charles H., Q.T.V., Box 51, Ocean Park, Cal.
 Casparian, Gregory, Floral Park, L. I., N. Y.
 *Chandler, Rev. Willard M. Died March 17, 1889, at Denver, Col.
 Chase, Harry K., $\Phi \Sigma K$, 42 Church St., New Haven, Ct. Manager New Haven Branch, Pittsburgh Plate Glass Co.
 Chipman, Frank E., 69 Nightingale St., Dorchester, Mass. Business address 83-91 Francis St., Boston, Mass. Treasurer, Boston Book Co.
 Clarke, Dr. Henry L., Q.T.V., Andover, Mass. Physician.
 *Clay, Cassius M. Died in 1888 at New York, N. Y.
 Cochran, Robert A., Q.T.V., 237 W. 2d St., Maysville, Ky. Cotton Manufacturer.
 Comins, William H., Hadley, Mass. Farmer, Deputy Sheriff.
 Crafts, George E., Bangor, Me. Treasurer, Orono Pulp and Paper Co.

Currier, George F. Address unknown.
 Delano, Julio J., Q.T.V. Address unknown (1915). 11 Santiago, Chile, S. A. (1897).
 *Deuel, Frank D. Died at Amherst, Mass., May 15, 1916.
 Doyle, John J. Address unknown.
 *Dutton, Charles K. Died July 30, 1880, at Boston, Mass.
 Fish, Charles S. Address unknown.
 Gowdy, Harry M., Westfield, Mass.
 Harris, Rev. Louis L., Cannon Falls, Minn. Clergyman.
 Harris, Richard B. Address unknown.
 Hill, Charles H., 229 Chestnut St. Business address Crocker McElwain Paper Co., Holyoke, Mass. Engineer.
 Holmes, Samuel J., 188 Park St., Montclair, N. J. Real Estate.
 Jackson, Andrew, Q.T.V., Napa Soda Springs, Cal.
 *Johnson, Frank P., $\Phi \Sigma K$. Died October 30, 1903.
 Jones, Edward S., 21 Court St. Business address, 116 Main St., Worcester, Mass.
 Jones, Nathaniel N., $\Phi \Sigma K$, 76 High St., Newburyport, Mass. Business address Room 508, 35 Congress St., Boston, Mass. Lawyer. LL.B., Boston University, 1883.
 Joyner, Frank H., 310 Palmetto Drive, Alhambra, Cal. Civil Engineer.
 Knowles, Dr. William F., Jr., $\Phi \Sigma K$, West Newton, Mass. Business address 220 Clarendon St., Boston, Mass. Physician.
 *Krauss, Alonzo A., Q.T.V. Died February, 1888, at Sterling, Col.
 *Leonard, Arthur. Died March 23, 1904.
 Lindsey, Frank B., Philmont, N. Y. Attorney.
 Livermore, Nathaniel L. Address unknown.
 Luques, Edward C., Q.T.V., 113 Main St., Biddeford, Me.
 Meade, William G., Box 813, Springfield, Mass.
 *Miller, W. S. Deceased.
 Parsons, Howard A., North Amherst, Mass. Farmer. Member State Board of Agriculture.
 Perkins, Charles B., Q.T.V. Address unknown.
 Platt, John C., 11 E. 24th St., New York, N. Y.
 Porter, Royal L. Address unknown.
 Putnam, Henry A., 6 Rock Ave., Worcester, Mass. Carpenter and Builder.
 Rhodes, William H. Address unknown.
 Smith, Herman K. Address unknown.
 *Wheeler, Henry L., Q.T.V. Died at Great Barrington, Mass. Date unknown.
 *Wheelock, Victor L. Died April 11, 1885, at Palmer, Mass.
 Willard, Daniel, $\Phi \Sigma K$, Roland Park, Baltimore, Md. President Baltimore & Ohio Railroad.
 Wilmarth, Dr. Frederick A. Address unknown.

1883

DR. J. B. LINDSEY, *Secretary*.

Bagley, Sydney C., $\Phi \Sigma K$, 769 Turnpike St., Stoughton, Mass. Poultry Farmer.
 Bishop, Edgar A., $\Lambda \Sigma \Phi$, Peterboro, N. H. Superintendent of Advanced Registry, American Guernsey Cattle Club. Chairman, Board of Education.
 Braune, Domingos H., D.G.K., Barra do Piray E do Rio, Brazil. Professor of Agriculture, Government Agricultural College.
 Hevia, Alfred A., $\Phi \Sigma K$, 252 McDonough St., Brooklyn, N. Y. Business address World Building, New York City. Real Estate and Insurance.
 Holman, Samuel M., Q.T.V., 39 Pleasant St., Attleboro, Mass. Insurance.
 Lindsey, Joseph B., $\Phi K \Phi$, $\Lambda \Sigma \Phi$, Amherst, Mass. Vice-Director and Chemist, Massachusetts Agricultural Experiment Station. Goessmann Professor of Chemistry, Massachusetts Agricultural College. A.M. and Ph.D., Göttingen, Germany, 1891.
 Minott, Charles W., C.S.C., 9 Lincoln St., Hudson, Mass. Business address U. S. Bureau of Entomology, Melrose Highlands, Mass. In charge of Gypsy Moth Food Plant Investigation.

Nourse, David O., C.S.C., Windsor Road, Newburgh, N. Y. Fruit Grower.
 Preston, Charles H., Φ K Φ , K Σ , Hathorne, Mass. Business address Danvers, Mass.
 Farmer. President and Acting Treasurer, Danvers Savings Bank.
 Trustee M. A. C.
 Wheeler, Dr. Homer J., A Σ Φ , 111 Grant Ave., Newton Center, Mass. Business
 address, 92 State St., Boston, Mass. Agricultural Chemical Expert for
 the American Agricultural Chemical Co. M.A. and Ph.D., Göttingen,
 1889; Sc.D., Brown University, 1911.

NON-GRADUATES

Chaplin, John D. H., Q.T.V., 1429 5th Ave., Seattle, Wash.
 Conger, Charles T. Address unknown.
 *Fletcher, Frank H. Deceased.
 Manton, William J. Bellevue, Texas.
 Owen, Henry W., Amherst, Mass.
 Seldon, John L., 6 Ahwaga Ave., Northampton, Mass.
 Smith, William E. Address unknown.
 Tryon, Charles O. Address unknown.

1884

E. A. JONES, *Secretary*.

Hermes, Charles, Q.T.V. Address unknown.
 Holland, Harry D., Amherst, Mass.
 Jones, Elisha A., Φ Σ K, New Canaan, Ct. Farm Superintendent.
 Smith, Llewellyn, Q.T.V. Address unknown.

NON-GRADUATES

*Brown, Henry C., D.G.K. Died February, 1884, at Ormon, Fla.
 Cutler, George, Jr., K Σ , Amherst, Mass. Dry goods Merchant.
 Davis, Arthur E., Q.T.V. Sterling, Mass.
 *Dickinson, Howard W. Died May, 1896.
 Dwight, Dr. Edwin W., D.G.K., 87 Milk St., Boston, Mass. Physician.
 *Goessmann, Henry E. V. Died April 27, 1882, at Amherst, Mass.
 Lublin, Alfred W., Φ Σ K, The Kora Co., 454 Broome St., New York, N. Y.
 Mayo, Dr. Walter P., Q.T.V., 34 Warren Rd., Framingham, Mass., P. O. Box 202.
 *Redding, Merton J. Died August 25, 1882, at Amherst, Mass.
 Smith, William H., 158 So. Pleasant St., Amherst, Mass. Farmer.
 Smith, William R. Address unknown.

1885

DR. E. W. ALLEN, *Secretary*.

Allen, Dr. Edwin W., Φ K Φ , A Σ Φ , 1923 Biltmore St., Washington, D. C. Chief,
 Office of Experiment Stations, United States Department of Agriculture.
 Ph.D., Göttingen, 1890.
 Almeida, Luciano J. de, D.G.K., Jacarehy, Est. de S. Paul, Brazil. Surveyor.
 Barber, Dr. George H., Q.T.V., U. S. Naval Hospital, Las Animas, Col. Physician
 and Surgeon for U. S. Navy. M.D., College for Physicians and Surgeons,
 New York, N. Y., 1888.
 Browne, Charles W., Φ K Φ , Φ Σ K, Northboro, Mass.
 Goldthwait, Dr. Joel E., Φ K Φ , C. S. C., 1 Charles River Square. Business address,
 372 Marlboro St., Boston, Mass. Physician. M.D., Harvard, 1890.
 Howell, Hezekiah, Φ Σ K, Washingtonville, Orange Co., N. Y. Retired.
 *Leary, Lewis C., D.G.K. Died April 3, 1888, at Cambridge, Mass.

Phelps, Charles S., Φ K Φ , K Σ , Canton, N. Y. Farmer. Farm Bureau Manager, St. Lawrence County.
 Taylor, Isaac N., Jr., K Σ , 1334 Van New Ave., San Francisco, Cal. Retired.
 Tekirian, Benoni O., C.S.C., 321 Newark St., Hoboken, N. J. Merchant.

NON-GRADUATES

Brooks, Paul C. P. Address unknown.
 Buffington, Charles O., D.G.K., Ware, Mass. Rural Mail Carrier.
 Cardoso, Peleusia. Address unknown.
 Chadbourne, Albert H., Φ Σ K, Cynwyd, Pa.
 *Cutter, Charles S., Φ Σ K. Died August, 1909.
 Day, William L., Warren, Mass. Farmer.
 Dickinson, John F., 751 Washington St., Brookline, Mass. Treasurer, Southern Belting Co., Atlanta, Ga.
 Jaqueth, Isaac S., Q.T.V., 346 Laurier Ave., West Ottawa, Canada.
 *Kendall, Charles I. Deceased.
 March, Wilbur M. Address unknown.
 Nash, John A., D.G.K., Medford, Mass.
 *Nichols, Andrew, Jr. Deceased.
 Putnam, George H., Φ Σ K. Address unknown.
 *Spaulding, Geo. E. Died August 27, 1889, at West Wardsboro, Vt.
 Spaulding, Charles P. 338 Junipero Ave., Long Beach, Cal.
 Whittemore, Joseph S., Φ Σ K, 41 Pleasant St., Leicester, Mass.
 *Woodhull, Geo. G. Deceased.

1886

DR. WINFIELD AYRES, *Secretary.*

Ateshian, Osgan H., C.S.C., c/o Dick Bros., 30 Broad St., New York, N. Y. Broker.
 Atkins, William H., D.G.K., Burnside, Ct. Florist.
 Ayres, Dr. Winfield, K Σ , 616 Madison Ave., New York, N. Y. Surgeon. M.D., Bellevue Hospital Medical College, 1893.
 Carpenter, David F., Φ K Φ , K Σ , Littleton, N. H. Superintendent of Schools.
 Clapp, Charles W., A Σ Φ , 288 Main St., Greenfield, Mass. Chief Engineer, Mass. Consol. Railways.
 Duncan, Dr. Richard F., Φ Σ K, 1236 Westminster St., Providence, R. I. Physician.
 Eaton, William A., D.G.K., Nyack, N. Y. Business address, 585 Hudson St., New York City. Lumber Salesman.
 Felt, Charles F. W., Φ K Φ , C.S.C., 5344 Hyde Park Blvd. Business address, 1033 Railway Exchange, Chicago, Ill. Civil Engineer.
 MacKintosh, Richard B., Φ K Φ , D.G.K., 21 Aborn St., Peabody, Mass. Machinist, United Shoe Machinery Co., Beverly, Mass.
 Sanborn, Kingsbury, Φ Σ K, Box 606, Riverside, Cal. Hydraulic Engineer.
 Stone, Dr. George E., Φ K Φ , Φ Σ K, Amherst, Mass. Professor of Botany, Massachusetts Agricultural College; Plant Pathologist, Massachusetts Agricultural Experiment Station. Ph.D., Leipsic University, Germany, 1892.
 Stone, George S., D.G.K., Otter River, Mass. Farmer.

NON-GRADUATES

Barker, John K., 332 Main St., Springfield, Mass.
 Bement, John E., Q.T.V., 103 Main St., Amherst, Mass. Coal Dealer.
 Copeland, Alfred B., Q.T.V., Russell, Mass. Farmer and Florist.
 Danks, Edward F., Q.T.V., 48 Friend St., Lynn, Mass.
 Day, Robert C. Address unknown.
 *Doucet, Walter H., D.G.K. Died February 3, 1892, at Philadelphia, Pa.
 Fowler, John H., 87 East Silver St., Westfield, Mass. Market Gardener.
 Gaskill, Milo A. Address unknown.
 Kinney, Arno L., Φ Σ K. Address unknown.
 Lang, Dr. Charles J. Address unknown.

*Leland, William E., Q.T.V. Died December 1, 1901.
 Palmer, Robert M., $\Phi \Sigma \K$, 405 Colman Building, Seattle, Wash. Banker.
 *Smith, Walter S. Died December 11, 1888, at Syracuse, N. Y.
 Wheeler, George W., $\Phi \Sigma \K$, Deposit, N. Y. Veterinary Surgeon.
 Winslow, Edgar D., D.G.K., Ware, Mass.

1887

F. H. FOWLER, *Secretary.*

Almeida, Augusto L. de, D.G.K., Rio Janeiro, Brazil.
 Barrett, Dr. Edward W., D.G.K., 34 Washington St., Medford, Mass. Physician.
 M.D., Jefferson Medical College, 1902.
 Caldwell, William H., $\K \Sigma$, Peterboro, N. H. Secretary and Treasurer, Guernsey Cattle Club; Proprietor, Clover Ridge Farm; Trustee, New Hampshire Agricultural College.
 Carpenter, Frank B., $\Phi \K \Phi$, C.S.C., 502 Hawthorne Ave., Richmond, Va. Business address, 11 S. 12th St., Richmond, Va. Chief Chemist, Virginia-Carolina Chemical Co.
 Chase, William E., 11 East 60th St., N., Portland, Ore. Farmer.
 Davis, Dr. Frederick A., C.S.C., 223 Majestic Bldg., Denver, Col. Oculist. M.D., Harvard, 1891; A.B., 1899, A.M., Harvard, 1900.
 Fisherdict, Cyrus W., C.S.C., Laplata, San Juan Co., New Mexico. Merchant and Rancher.
 Flint, Dr. Edward R., $\Phi \K \Phi$, Q.T.V., Gainesville, Fla. Professor of Chemistry, University of Florida. Ph.D., Göttingen, Germany, 1892; M.D., Harvard, 1902.
 Fowler, Frederick H., $\Phi \K \Phi$, C.S.C., Shirley, Mass. Clerk, Industrial School for Boys.
 Howe, Clinton S., C.S.C., West Medway, Mass. Farmer.
 *Marsh, James M., C.S.C. Died in June, 1913, at Chicago, Ill.
 Marshall, Charles L., D.G.K., Randolph St., Canton, Mass. Superintendent, York Brook Farm.
 *Meehan, Thomas F. B., D.G.K. Died April 4, 1905, at Boston, Mass.
 Osterhout, Jeremiah C., Chelmsford, Mass. Farmer.
 Richardson, Evan F., $\Phi \Sigma \K$, Millis, Mass. Farmer. Norfolk County Commissioner.
 Rideout, Henry N. W., Q.T.V., 7 Howe St., Winter Hill, Mass. Assistant Paymaster, B. & M. R. R.
 Tolman, William N., $\Phi \Sigma \K$, 1401 Arch St., Philadelphia, Pa. Civil Engineer with United Gas Improvement Co.
 Torelly, Firmino DaS., D.G.K., Cidade do Rio Grande do Sud, Brazil.
 *Watson, Charles H., Q.T.V. Died September 6, 1914, at San Antonio, Texas.

NON-GRADUATES

Allen, Frederick C., $\Phi \Sigma \K$, 65 West Houston St., New York, N. Y. Bookkeeper.
 *Avery, David E. Died February 7, 1898.
 *Ball, William M. Died June 22, 1909.
 Bond, Richard H., $\Phi \Sigma \K$, Box 26, Needham, Mass. Farmer.
 Breen, Timothy R., Thorndike, Mass. Machinist.
 Brown, Frederick W., Amherst, N. H. Business address, 246 Summer St., Boston, Mass. Directory Compiler.
 Brown, Herbert L., 30 Clement Ave., Peabody, Mass. Postal Service.
 Chapin, Clinton G., D.G.K., 165 Chicopee St., Chicopee, Mass. Farmer.
 Clarke, Frank S., $\Phi \Sigma \K$, 9 Lake St., Hopedale, Mass. Bookkeeper, Draper Co.
 Cushman, Ralph H., Bernardston, Mass. Farmer.
 Daniels, Joseph F., Carlisle News Co., 217 16th St., Denver, Col. (1913).
 Hathaway, Bradford O., 74 Parker St., New Bedford, Mass.
 Kasmire, Geo. F., Freetown, Mass. Business address, 790 Purchase St., New Bedford, Mass.
 *Long, Stephen H., $\Phi \Sigma \K$. Died May 25, 1904.
 Martin, Joseph, 2d, 20 Evans Rd., Marblehead, Mass. Dairyman.

Merchant, Charles E., 96 Hawthorne St., East Weymouth, Mass. Foreman, Shoe factory.
 Merritt, Walter H., 3 High St. Place, Springfield, Mass. Machinist.
 Nourse, Silas J., 61 Dana St., West Haven, Ct. Bricklayer.
 Paine, Ansel W., $\Phi \Sigma K$, 198 Bird Ave., Buffalo, N. Y. U. S. Immigrant Inspector.
 Robinson, George P., Q.T.V., Fair Oaks. Business address, Sacramento, Cal. Cattle. Real Estate.
 Rose, Newton A., Fitchburg, Mass. Farmer.
 Shaughnessy, Hon. John J., 64 Fairmont St., Marlboro, Mass. Lawyer. LL.B.
 Stone, Fremont E. Address unknown.
 Tucker, Frederick D., 413 Times Bldg., St. Louis, Mo. Real Estate. B.A., Yale.
 White, Dr. Herbert J., $\Phi \Sigma K$, 177 Kenyon St., Hartford, Ct. Clergyman. Pastor, First Baptist Church. D.D., 1908.

1888

H. C. BLISS, *Secretary*.

Belden, Edward H., C.S.C., Sharon, Mass. Farmer.
 Bliss, Herbert C., $K \Sigma$, 14 Mechanic St. Business address, 191 No. Main St., Attleboro, Mass. Manufacturing Jeweler.
 Brooks, Frederick K., C.S.C., 36 Brockton Ave., Haverhill, Mass. Laundry business.
 Cooley, Fred S., $\Phi K \Phi$, $\Phi \Sigma K$, Bozeman, Mont. Director, Agricultural Extension Service.
 Dickinson, Edwin H., C.S.C., North Amherst, Mass. Farmer.
 Field, Samuel H., C.S.C., North Hatfield, Mass. Farmer.
 Foster, Francis H., 98 Central St., Andover, Mass. Civil Engineer and Poultry Farmer.
 Hayward, Albert I., C.S.C., Ashby, Mass. Farmer.
 Holt, Jonathan E., C.S.C., 67 Bartlett St., Andover, Mass. Salesman.
 Kinney, Lorenzo F., Kingston, R. I. Commercial Horticulturist.
 Knapp, Edward E., $K \Sigma$, 341 Fourth Ave., Parnassus, Pa. Business address, New Kensington, Pa. District Manager, The Atlantic Ref. Co.
 Mishima, Viscount Y., D.G.K., Seudagaya, Tokyo, Japan.
 Moore, Robert B., $\Phi K \Phi$, C.S.C., 217 Stiles St., Elizabeth, N. J. Business address, Liebig Works, Carteret, N. J. Chemist.
 *Newman, George E., Q.T.V. Died March, 1910.
 Noyes, Frank F., $K \Sigma$, 472 N. Jackson St., Atlanta, Ga.
 Parsons, Wilfred A., $\Phi \Sigma K$, Southampton, Mass. Farmer.
 Rice, Thomas, 2d, D.G.K., 329 Walnut St., Fall River, Mass. Journalist.
 Shepardson, William M., C.S.C., Middlebury, Ct. Farm Superintendent.
 Shimer, Boyer L., Q.T.V., Bethlehem, Pa. Farmer and Real Estate.

NON-GRADUATES

Ayer, Warren, $\Phi \Sigma K$, 65 East Haverhill St., Lawrence, Mass.
 Cutler, Dr. Geo. W., $\Phi \Sigma K$, Bridgewater, Mass. Poultryman. M.D., Harvard, 1892.
 *Dole, Edward J., $\Phi \Sigma K$. Deceased.
 Groeger, Gustavus. Address unknown.
 *Hinsdale, Rufus C., $\Phi \Sigma K$. Deceased.
 Johnson, Irving H., 50 Woodland St., Newburyport, Mass. Principal, Grammar School.
 Loomis, Herbert R., North Amherst, Mass. Farmer.
 Parker, James S., Salem, N. Y.
 Rogers, Dr. Howard P., $\Phi \Sigma K$, 68 Cochituate St., Saxonville. Business address, Framingham, Mass. M.D.V., 1891.
 Smith, Willis P., 417 N. Madison Ave., Pasadena, Cal.
 White, Henry K., Whately, Mass.
 Worthington, Alvan F., 9 Cedar St., East Dedham, Mass. Insurance.

F. W. DAVIS, *Secretary*.

- Blair, James R., Q.T.V., 52 Massachusetts Ave. Business address, 158 Massachusetts Ave., Cambridge, Mass. Superintendent of C. Brigham Co., Milk Contractors.
- *Copeland, Arthur D., K Σ. Died September 3, 1907, at Boston, Mass.
- Crocker, Charles S., K Σ, 1003 So. 25th St., Philadelphia, Pa. Chemist with American Agricultural Chemical Co.
- Davis, Franklin W., Φ K Φ, Φ Σ K, 85 Colberg Ave., Roslindale, Mass. Editor.
- Hartwell, Dr. Burt L., Φ K Φ, C.S.C., Kingston, R. I. Chemist, Agronomist and Director, R. I. Agricultural Experiment Station. M.Sc., Massachusetts Agricultural College, 1900; Ph.D., University of Penn., 1903.
- Hubbard, Dwight L., C.S.C., Billerica Center, Mass. Civil Engineer.
- Hutchings, James T., Φ Σ K, 65 W. Averill Ave. Business address, 34 Clinton Ave., N., Rochester, N. Y. General Manager, Rochester Railway and Light Co. President, Utilities Mutual Insurance Co. of New York.
- *Kellogg, William A. Died March 28, 1910, at Northampton, Mass.
- Miles, Dr. Arthur L., C.S.C., 12 Magazine St., Cambridge, Mass. Dentist. D.D.S., Boston Dental College, 1898; D.M.D., Tufts College, 1909.
- North, Dr. Mark N., Q.T.V., 132 Columbia St., Cambridge, Mass. Veterinarian. M.D.V., 1895.
- Nourse, Arthur M., C.S.C., Westboro, Mass. Farmer.
- Sellew, Robert P., Φ Σ K, 1368 Commonwealth Ave. Business address, 7 Merchants Row, Boston, Mass. Sales Manager, Chapin & Co.
- Whitney, Charles A., C.S.C., North Main St., Upton, Mass.
- Woodbury, Dr. Herbert E., 571 East Drive, Woodruff Place, Indianapolis, Ind.

NON-GRADUATES

- Adams, George A., Φ Σ K. Address unknown.
- Alger, George W., West Bridgewater, Mass. Farmer.
- Alger, Isaac, Jr., Q.T.V., 247 Pleasant St., Attleboro, Mass. Farmer.
- Colcord, Wallace R., Q.T.V., Rockport, Mass.
- Huse, Frederick R., Φ Σ K, 66 Wyman St., West Medford, Mass. Business address, 80 North St., Boston, Mass.
- Lumbard, Dr. Joseph E., 1925 Seventh Ave., Graham Court, New York, N. Y. Physician.
- Okami, Yoshiji. Address unknown (1915). Tokyo, Japan (1897).
- Smith, James R., Q.T.V. Address unknown.
- Sprague, William A., Chepachet, R. I.
- Waite, Herbert H. Address unknown.
- *Wells, Charles O. Died April 10, 1892, at Hatfield, Mass.
- Wentworth, Elihu F. Address unknown.
- White, Louis A., San Gabriel, Cal.

DAVID BARRY, *Secretary*.

- Barry, David, Φ K Φ, Q.T.V., 398 Walnut St., Newtonville, Mass. Electrician.
- *Bliss, Clinton E., D.G.K. Died August 24, 1894, at Attleboro, Mass.
- *Castro, Arthur de M., D.G.K. Died May 2, 1894, at Juiz de Fora, Minas, Brazil.
- Dickinson, Dr. Dwight W., Q.T.V., 19 Melendy Ave., Watertown, Mass. Dentist. D.M.D., Harvard, 1895.
- Felton, Truman P., C.S.C., West Berlin, Mass. Farmer.
- Gregory, Edgar, C.S.C., 115 Elm St., Marblehead, Mass. Seedsman.
- Haskins, Henri D., Q.T.V., Amherst, Mass. In charge of Fertilizer Division, Massachusetts Agricultural Experiment Station.
- Herrero, José M., D.G.K., Havana, Cuba. Editor.
- Jones, Charles H., Φ K Φ, Q.T.V., 83 Brooks Ave., Burlington, Vt. Chemist, Vermont Agricultural Experiment Station. M.S., University of Vermont, 1907.

*Loring, John S., D.G.K. Died January 17, 1903, at Orlando, Fla.
 McCloud, Albert C., Q.T.V., Amherst, Mass. Insurance and Real Estate.
 Mossman, Fred W., C.S.C., Westminster, Mass. Farmer.
 Russell, Henry L., D.G.K., Pawtucket, R. I. Secretary and Treasurer, Pawtucket Ice Co.
 *Simonds, George B., C.S.C. Died July 19, 1909, at Fitchburg, Mass.
 Smith, Frederick J., Φ K Φ , Q.T.V., Pierce, Fla. Chemist. M.Sc., Massachusetts Agricultural College, 1896.
 Stowe, Arthur N., Q.T.V., Hudson, Mass. Farmer.
 Taft, Walter E., D.G.K., 182 Willard St., Berlin, N. H. Mechanical Engineer.
 Taylor, Dr. Frederick L., Q.T.V., 45 Centre St., Roxbury, Mass. Physician. M.D., Harvard, 1901.
 *West, John S., Q.T.V. Died July 13, 1902, at Belchertown, Mass.
 Williams, Frank O., Q.T.V., Sunderland, Mass. Farmer.

NON-GRADUATES

Braman, Samuel N., Φ Σ K, c/o 33 Pearl St., Boston, Mass.
 *Coburn, Oscar B., Q.T.V. Died November 15, 1889, at Weston, Mass.
 Fellows, George S. Address unknown.
 Frost, William L., Φ Σ K. Address unknown.
 *Fuller, Edward A. Died April 27, 1914.
 Goddard, George A., Q.T.V. Address unknown.
 Hallet, Charles W., Barnstable, Mass. Machinist.
 Hogan, Frederick W. Address unknown.
 Maynard, John B. Address unknown.
 *Pearson, George G., Φ Σ K. Died November 29, 1889, at Reading, Mass.
 Russell, Fred N., 50 Adams St., Winthrop, Mass.
 Stillings, Dr. Levi Chamberlain. Address unknown.
 Stratton, Edward N., Q.T.V., 113 Brigham St., Marlboro, Mass.
 Thayer, Bernard. Address unknown.
 Whitcomb, Nahum H., R. R. No. 1, Concord Junction, Mass. Farmer.
 *Williams, Arthur S. Died September 8, 1888.

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DR. H. T. SHORES, *Secretary*.

Arnold, Frank L., Φ K Φ , Q.T.V., 32 School St., Woburn, Mass. Chemist.
 *Brown, Walter A., C.S.C. Died January 18, 1910, at Springfield, Mass.
 Carpenter, Malcolm A., C.S.C., 12 Linden Ave., Grenfield, Mass. Business address, Sharon, Ct. Superintendent of Estate. Landscape Gardener.
 Eames, Aldice G., Φ Σ K, North Wilmington, Mass. B.L., Cornell University, 1893; M.L., Cornell, 1894. Advisory Department, N. Y., N. H. & H. R. R.
 Felt, Dr. E. Porter, C.S.C., Nassau, N. Y. Business address, State Museum, Albany, N. Y. State Entomologist. D.Sc., Cornell, 1894.
 Field, Henry J., Q.T.V., Greenfield, Mass. Lawyer, Judge of Franklin County District Court. LL.B., Cornell, 1896.
 Gay, Willard W., D.G.K., 156 Fifth Ave., New York, N. Y. Landscape Gardener and Engineer.
 Horner, Louis F., C.S.C. Address unknown.
 Howard, Henry M., C.S.C., 284 Fuller St., West Newton, Mass. Market Gardener.
 Hull, Hon. John B., Jr., D.G.K., Great Barrington, Mass. Coal Merchant. State Senator, 1916.
 Johnson, Charles H., D.G.K. Address unknown.
 Lage, Oscar V. B., D.G.K., Juiz de Fora, Minas, Brazil.
 *Legate, Howard N., D.G.K. Died March 28, 1912, at Roxbury, Mass.
 Magill, Claude A., 248 Willow St. Business address, 902 Chapel St., New Haven, Ct. General Manager, Ct. Hassam Paving Co.
 Paige, Walter C., D.G.K., 1009 Jackson Blvd., Houston, Texas. General Secretary, Y. M. C. A.

Ruggles, Murray, C.S.C., 25 School St., Milton, Mass. Superintendent, Electric Light Co.
 Sawyer, Arthur H., Q.T.V., Nutley, N. J. Cement Inspector.
 Shores, Dr. Harvey T., K Σ, 177 Elm St., Northampton, Mass. Physician. M.D., Harvard, 1894.

NON-GRAUDATES

Belden, Allan M., 104 Alden St., Springfield, Mass. Milk Dealer.
 Bush, Edward, Box 222, North Scituate, Mass.
 Crandall, Charles S., Agricultural Experiment Station, Fort Collins, Col.
 Davenport, Alfred M., 88 Grove St., Watertown, Mass.
 DuBois, Cornelius M., Φ Σ K, Essex, Mass. (1912).
 Hull, Henry B., Φ Σ K, 223 Whalley Ave., New Haven, Ct. Shipping Clerk.
 *Hurley, Michael E. Died January 10, 1899, at Amherst, Mass.
 Palmer, Herbert W. Address unknown.
 Phillips, John E. S., 14 Academy St., Danielson, Ct.
 *Pond, William H. Deceased.
 Richards, George E., 4 Ivory St., West Roxbury, Mass.
 Russell, Edward E., C.S.C., 4 Hudson St. Business address, 5 Sargent St., Worcester, Mass. Engineer.
 Sanderson, Harry T., Q.T.V., Leicester, Mass. With American Steel and Wire Co.
 Turnbull, Ernest H. Address unknown.
 *Tuttle, Henry F. Died February 14, 1892, at Amherst, Mass.
 Wood, Augustus R., Q.T.V., Raymondville, Texas. Teacher.

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H. M. THOMSON, *Secretary.*

Beals, Alfred T., Q.T.V., 4 West 28th St. Business address, 71 West 23d St., New York, N. Y. Photographer.
 Boynton, Dr. Walter I., Q.T.V., 73 Dartmouth St. Business address, 310 Main St., Springfield, Mass. Dentist. D.D.S., Boston Dental College, 1895.
 Clark, Edward T., C.S.C. Superintendent, Walker-Gordon Milk Farm, So. Sudbury, Mass.
 Crane, Henry E., C.S.C., Monroe Rd., Quincy, Mass.
 Deuel, James E., Q.T.V., Amherst, Mass. Druggist. Ph.G., College of Pharmacy, Boston.
 Emerson, Henry B., C.S.C., 6 Central St., Methuen, Mass. Superintendent, Mech. Dept., Arlington Mill.
 Field, Judson L., Q.T.V., 160 N. Euclid Ave., Oak Park, Ill. Business address, 223 W. Jackson Blvd., Chicago, Ill. Director, Jenkins, Kreer & Co.
 Fletcher, William, C.S.C. Address unknown.
 Graham, Charles S., C.S.C., R. R., Holden, Mass. Farmer.
 Holland, Dr. Edward B., Φ K Φ, K Σ, 28 N. Prospect St., Amherst, Mass. Associate Chemist, Massachusetts Agricultural Experiment Station. M.Sc., Massachusetts Agricultural College, 1898; Ph.D., 1915.
 *Hubbard, Cyrus M., Q.T.V. Deceased.
 Knight, Jewell B., Q.T.V., Poona, India, Ganeshkhind Rd. Professor of Agriculture, and Director, Experiment Station, Poona College. M.Sc., Massachusetts Agricultural College, 1901.
 Lyman, Dr. Richard P., Q.T.V., Box 1018, East Lansing, Mich. Dean of Veterinary Division, Michigan Agricultural College. M.D.V., Harvard, 1894.
 Plumb, Frank H., Q.T.V., Stafford Springs, Ct. Farmer.
 Rogers, Elliott, Φ Σ K, Kennebunk, Me. Manufacturer.
 *Smith, Robert H., Φ Σ K. Died March 25, 1900, at Amherst, Mass.
 Stockbridge, Francis G., Φ K Φ, D.G.K., R. R. No. 3, Englishtown, N. J. Farmer.
 Taylor, George E., Φ K Φ, Q.T.V., Shelbourne, Mass. Farmer.
 Thomson, Henry M., Φ K Φ, C.S.C., Amherst, Mass. Farmer.
 West, Homer C., Q.T.V., Granite, Ore. Traveling Agent.

Willard, George B., $\Phi \Sigma K$, 14 Lafayette St., Waltham, Mass. Business address, State House. Deputy Treasurer and Receiver-General of Massachusetts.
 Williams, Dr. Milton H., Q.T.V., Sunderland, Mass. Veterinarian. M.D.V., Harvard, 1894.

NON-GRAUDATES

Baldus, Francis G., Q.T.V., 78 Belcher Ave. Business address, 179 Lincoln St., Brockton, Mass. Traveling Salesman.
 Bardin, James E., Dalton, Mass. Farmer.
 Chamberlain, Pierce A. Address unknown.
 Condit, Charles De H., Boonton, N. J. Farmer and Manufacturer.
 Davidson, Royal P., D.G.K., Lake Geneva, Wis. Superintendent, Northwestern Military and Naval Academy.
 Eaton, Henry N., South Sudbury, Mass.
 Faneuf, Arthur G., 185 King St., Springfield, Mass. Machinist.
 Farrar, Frederick A., 54 Harrison Ave., Northampton, Mass.
 Fowle, Dr. Samuel O., 1132 Great Plain Ave., Needham, Mass. Veterinarian.
 Goldthwait, William J., Jr., D.G.K., 114 Elm St., Marblehead, Mass. Manager, Real Estate Trust.
 Gorham, Frederick S., Cor. E. Main and State Sts., Westport, Ct.
 Haley, George W., Q.T.V., Box 440, Stonington, Ct. Stationer.
 Hoar, Thomas. Address unknown.
 Howe, Elbridge L., $\Phi \Sigma K$, 1022 Michigan Ave., Evanston, Ill.
 Lindsey, Ernest, 7 Gerry St., Marblehead, Mass.
 McDonald, Frederick J. Address unknown.
 Nauss, Charles S., 118 Washington St., Gloucester, Mass. Lumber Dealer.
 Page, Harry Savage, Hempstead, L. I.
 Saville, James R. Address unknown.
 Sedgwick, Benjamin. Address unknown.
 Stone, Dr. Harlan Fisk, Dean, Columbia Law School, New York, N. Y. LL.B., Columbia; A.B., Amherst College; LL.D., Amherst College, 1913.
 Tyng, Charles. Address unknown.
 Tyng, George M., $\Phi \Sigma K$. Address unknown.
 Weed, Wallace D., Marblehead, Mass.

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F. A. SMITH, *Secretary*.

Baker, Joseph, Q.T.V., N. Grosvenordale, Ct. Farmer.
 Bartlett, Frederick G., D.G.K., 298 Cabot St., Holyoke, Mass. Superintendent, Forestdale Cemetery.
 Clark, Dr. Henry D., C.S.C., 69 High St., Fitchburg, Mass. Veterinarian. D.V.S., McGill University, 1895.
 Curley, Dr. George F., $\Phi K \Phi$, C.S.C., 10 Congress St., Milford, Mass. Physician and Associate Medical Examiner. M.D., Jefferson Medical College, 1896.
 Davis, Herbert C., Q.T.V., 32 Carnegie Way, Atlanta, Ga. Railway Mail Service.
 Goodrich, Dr. Charles A., D.G.K., 5 Haynes St., Hartford, Ct. Physician. M.D., College for Physicians and Surgeons, New York, 1896.
 Harlow, Francis T., $\Phi \Sigma K$, P. O. Box 106, Marshfield, Mass. Farmer.
 Harlow, Harry J., $K \Sigma$, Shrewsbury, Mass. Farmer.
 Hawks, Ernest A., C.S.C. Address unknown.
 Henderson, Frank H., D.G.K., 2 President St., New Rochelle, New York. Business address, 101 Park Ave., New York City. Civil Engineer.
 Howard, Edwin C., $\Phi \Sigma K$, 3 Stratford St., West Roxbury, Mass. Teacher, Oliver Hazard Perry School.
 Hoyt, Franklin S., $\Phi K \Phi$, C.S.C., 44 Winthrop St., West Newton, Mass. Business address, 4 Park St., Boston, Mass. Editor, Educational Department, Houghton, Mifflin & Co., A.M., Columbia, 1904.

Lehnert, Dr. Eugene H., Φ K Φ , K Σ , 7 Franklin St., Northampton, Mass. D.V.S., McGill University, 1895. Teacher, Smith's Agricultural School.
 Melendy, A. Edward, Q.T.V., 11 Grant St., Wollaston, Mass. Clerk, C. and R. Dept., U. S. Navy.
 Perry, John R., D.G.K., 700 Commonwealth Ave., Newton Centre, Mass. Business address, 101 Tremont St., Boston, Mass. Decorator and Painter.
 Smith, Cotton A., Q.T.V., Los Angeles Athletic Club, Los Angeles, Cal. Real Estate. Ph.B., Sheffield Scientific School, 1894.
 Smith, Fred A., A Σ Φ , Middleton, Mass. Business address, Hathorne, Mass. Director, Essex County Agricultural School.
 Smith, Luther W., Φ Σ K, Manteno, Ill. Stock Farmer.
 Staples, Dr. Henry F., A Σ Φ , 3054 Somerton Rd., Cleveland, Ohio. Physician. M.D., Cleveland University of Medicine and Surgery, 1896.
 Tinoco, Luis A. F., D.G.K., Campos, Rio Janeiro, Brazil. Planter and Manufacturer.
 Walker, Edward J., C.S.C., Box 315, Clinton, Mass. Farmer.

NON-GRADUATES

*Barrus, Sheridan E. Deceased.
 Barton, Charles H., 456 Main St., Buffalo, N. Y. Shoe Specialist.
 *Green, Carlton D., Q.T.V. Died January, 1892, at Belchertown, Mass.
 Gregory, James H., Φ Σ K, Cia Huanchaca de Bolivia, Autofagasta Chile, S. A.
 *Harvey, David P. Died in 1890.
 Haskell, Ernest A. Address unknown.
 Higgins, Nelson F., 150 State St., Springfield, Mass.
 Kellogg, John H. Address unknown.
 Lane, William A. Address unknown.
 Munro, David. Address unknown.
 Parker, Charles H., 340 Main St., Worcester, Mass. Real Estate.
 *Pember, Walter S., Q.T.V. Died December 22, 1893.
 Poole, Jerome, Rockport, Ct.
 Ranney, William H., Hood Farm, Derry Village, N. H. Superintendent.
 Soule, George W. Address unknown.
 Wells, Louie E., North Ashford, Ct. Farmer.
 *Woodbrey, Gilpin B. Died 1895 or 1896 at Waltham, Mass.
 Yamamura, Kohachi, Yehimeken, Japan.

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DR. S. F. HOWARD, *Secretary*.

Alderman, Edwin H., C.S.C., R. F. D. No. 2, Chester, Mass. Farmer.
 Averell, Fred G., Q.T.F., 106 Milton Ave., Dorchester, Mass. Business address 27 Kilby St., Boston, Mass. Insurance.
 Bacon, Linus H., Q.T.V., 36 Cherry St. Business address 136 Main St., Spencer, Mass. With Phoenix Paper Box Co.
 Bacon, Dr. Theodore S., Φ K Φ , Φ Σ K, 69 Maple St., Springfield, Mass. Physician. M.D., Harvard, 1898.
 Barker, Louis M., A Σ Φ , Hanson, Mass. Lumber Dealer.
 Boardman, Edwin L., C.S.C., Sheffield, Mass. Farmer.
 Brown, Charles L., C.S.C., East Longmeadow, Mass. Fruit Grower.
 Curtis, Arthur C., C.S.C., 40 Hawthorn St., Cambridge, Mass. Teacher.
 Cutter, Dr. Arthur H., Φ Σ K, 19 Prospect St. Business address 43 Broadway, Lawrence, Mass. Surgeon. M.D., Harvard, 1901.
 Davis, Perley E., Q.T.V., Granby, Mass. Farmer.
 Dickinson, Dr. Eliot T., Q.T.V., 32 Maple St., Florence, Mass. Business address 138 Main St., Northampton, Mass. Dentist. D.M.D., Harvard, 1898.
 Fowler, Halley M., D.G.K., 32 Hamden Circle, Wollaston, Mass. Railway Postal Clerk.
 *Fowler, Henry J., C.S.C. Died February 2, 1911, at Hadley, Mass.
 Gifford, John E., K Σ , 110 Hobart St., Danvers, Mass. Instructor Animal Husbandry and Dairying, Essex County Agricultural School.

- Greene, Frederick L., C.S.C., Escalon, Cal. Rancher. A.M., Columbia, 1899.
 Greene, Ira C., Q.T.V., Box 343, Fitchburg, Mass. Ice and Coal Dealer.
 Higgins, Dr. Charles H., A Σ Φ , 196 Cartier St., Ottawa, Canada. Pathologist to Department of Agriculture, Dominion of Canada. D.V.S., McGill University, 1896; Fellow of the Royal Microscopical Society of London, England, 1910.
 Howard, Dr. S. Francis, Φ K Φ , Φ Σ K, Norwich University, Northfield, Vt. M.Sc., Massachusetts Agricultural College, 1901; Ph.D., Johns Hopkins University, 1912. Professor of Chemistry.
 Keith, Thaddeus F., Q.T.V., St. Petersburg, Fla. Confectionery Manufacturer.
 Kirkland, Archie H., Φ Σ K, Huntington, Mass. Farmer. M.Sc., Massachusetts Agricultural College, 1896.
 Lounsbury, Charles P., Φ K Φ , Φ Σ K, Box 513, Pretoria, So. Africa. Chief of Division of Entomology, Dept. of Agriculture.
 Manley, Lowell, K Σ , West Roxbury, Mass. Superintendent Weld Farm.
 Merwin, George H., C.S.C., Southport, Conn. Farmer.
 Morse, Alvertus J., Q.T.V., 8 Third Ave. Business address 59 Main St., Northampton, Mass. Lawyer. LL.B., Boston University, 1901.
 *Pomeroy, Robert F., C.S.C. Died in 1909.
 Putnam, Joseph H., K Σ , Franklin County Farm Bureau, Greenfield, Mass.
 Sanderson, William E., K Σ . Address unknown.
 Smead, H. Preston, K Σ , Ludlow, Mass. Farmer.
 *Smith, George E., C.S.C. Died January 20, 1911.
 Smith, Ralph E., Φ K Φ , Φ Σ K, Berkeley, Cal. Professor of Plant Pathology, University of California.
 Spaulding, Charles H., Φ Σ K, 223 Massachusetts Ave., Lexington, Mass. United States Inspector, Engineering Dept.
 Walker, Dr. Claude., C.S.C., 63 Downing St., Brooklyn, N. Y. Assistant Principal and Head, Physics Department Boys High School, Brooklyn. Ph.D., Yale University, 1897.
 White, Elias D., Φ Σ K, Athens, Ga. Postal Service.

NON-GRADUATES

- Allen, Edward W., Ashuelot, N. H. Farmer.
 *Austin, John. Died in 1897.
 Babbitt, Ellwood G., Φ Σ K, 625 11th Ave. Business address 307 Custom House, San Francisco, Cal. Commercial Agent, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce.
 Bentley, Irving W. Address unknown.
 Blanchard, Samuel P., Harvard, Mass.
 Cook, Jay E. Address unknown.
 Drowne, George L., 2 Catalpa Rd., Providence, R. I.
 Duffield, William C. Address unknown.
 Goessmann, Louis E., D.G.K., 224 Congress St., Boston, Mass. Manager Boston office, Innis-Speiden & Co.
 Goodell, John S., Nahiku, Maui, T. H. Farmer.
 *Johnson, Charles F. Died May 11, 1915.
 *Learned, Henry B. Died January 3, 1891.
 Mann, Henry J., Mt. Hood, Wasco Co., Ore. (1894).
 Marvin, Samuel B., Φ Σ K, Richford, Vt.
 *Morse, Elisha W. Died April 18, 1915, at Washington, D. C.
 Ono, Saburo. Address unknown (1915). Ono, Echizen, Japan (1897).
 Park, Fred W., Φ Σ K, Chelmsford, Mass. Artesian Wells.
 *Parker, Frank I. Deceased.
 Parker, Jacob, 1125 Boston Road. Business address Boston Road and 166th St., New York, N. Y. Teacher.
 Robbins, Dana W. Address unknown.
 Sanford, George O., Q.T.V., 316 4th St., N. Great Falls, Mont. Engineer.
 Starr, Erastus J., Φ Σ K, Spencer, Mass. Superintendent, Water Works.
 *Stockwell, Harry G. Died October 18, 1893.
 Streeter, Albert R., Maple Dell, Cummington, Mass.

Thompson, Edmund F., 41 Fairhaven Road, Worcester, Mass. Electrical Engineer.
Whitcomb, Arthur M., West Acton, Mass. Insurance.

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E. A. WHITE, *Secretary*.

- Ballou, Henry A., Φ K Φ , Q.T.V., Bramar, Barbados, B.W.I. Entomologist, Imperial Dept. of Agriculture of the West Indies. M.Sc., Massachusetts Agricultural College, 1906.
- Bemis, Waldo L., Q.T.V., Spencer, Mass. Manufacturer.
- Billings, George A., C.S.C., Silver Springs, Md. Business address Office Farm Management, U. S. Dept. of Agriculture, Washington, D. C.
- *Brown, William C., D.G.K. Died April 15, 1915.
- Burgess, Albert F., Φ Σ K, 47 Sargent St., Melrose Highlands, Mass. Business address 43 Tremont St., Boston, Mass. Entomologist. M.Sc., Massachusetts Agricultural College, 1898.
- Clark, Harry E., Φ Σ K, Middlebury, Ct. Farm Superintendent.
- Cooley, Robert A., Φ Σ K, 810 Central Ave., Bozeman, Mont. Professor of Zoölogy and Entomology, Montana Agricultural College. State Entomologist.
- Crehore, Charles W., Φ Σ K, Chicopee, Mass. Farmer.
- Dickinson, Charles M., Q.T.V. Address unknown.
- Fairbanks, Herbert S., K Σ , 321 W. Hansberry St., Germantown, Pa. Business address, 13th and Chestnut Sts., Philadelphia, Pa. Patent Attorney.
- Foley, Thomas P., C.S.C., 466 Valley Road, West Branch, N. Y. Draughtsman.
- Frost, Harold L., Φ K Φ , Φ Σ K, 93 Brantwood Road. Business address 20 Mill St., Arlington, Mass. Forester and Farmer; Trustee, M. A. C.
- Hemanway, Herbert D., C.S.C., 11 Foster St., Worcester, Mass. In charge of Boys' and Girls' Work, Worcester County Farm Bureau.
- Jones, Robert S., Φ Σ K, 1294 W. 114th St., Cleveland, Ohio. Civil Engineer.
- Kuroda, Shiro, Φ Σ K, 127 Second St., Osaka, Japan.
- Lane, Clarence B., D.G.K., 6924 McCallum St., Germantown, Pa. Business address 1118 Jefferson St., Philadelphia, Pa. Dairyman.
- Lewis, Henry W., Cartagena, Columbia, S. A.
- Marsh, Jasper, K Σ , Danvers, Mass. Electric Lamp Manufacturer.
- Morse, Walter L., K Σ , Bellair Driveway, Dobbs Ferry, N. Y. Business address Room 5621 Grand Central Terminal, New York, N. Y. Special Assistant Engineer, N. Y. C. R. R. Co. Chief Engineer, Jacksonville Terminal Co.
- Potter, Daniel C., C.S.C., Fairhaven, Mass. Landscape and Sanitary Engineer.
- Read, Henry B., Φ Σ K, Barre, Mass. Farmer.
- Root, Wright A., Φ Σ K, Easthampton, Mass. Fruit Grower.
- Smith, Arthur B., Q.T.V., 1404 Olive Ave., Chicago, Ill. Correspondent and Book-keeper.
- *Stevens, Clarence L. Died October 8, 1901, at Sheffield, Mass.
- Sullivan, Maurice J., Littleton, N. H. Manager "The Rocks" Estate.
- Tobey, Frederick C., C.S.C., West Stockbridge, Mass. Lime Manufacturer.
- Toole, Stephen P., Hadley, Mass.
- Warren, Dr. Franklin L., Q.T.V., Bridgewater, Mass. Physician.
- White, Edward A., Φ K Φ , K Σ , Department of Floriculture, Cornell University, Ithaca, N. Y. Professor of Floriculture.

NON-GRADUATES

- Bagg, Edward O., Q.T.V., 1067 Riverdale St., West Springfield, Mass. Chauffeur.
- Brown, Mendall H., 49 Bristol St., Springfield, Mass.
- Clark, Edile H., Q.T.V. Brookfield, Mass.
- Court, William B. Address unknown.
- Davis, Alfred W., D.G.K. Address unknown.
- Drury, Ralph W., Q.T.V., War Department, Washington, D. C. Army Officer.
- Dwyer, Elmer F., 34 Maple St., Lynn, Mass. Manufacturer.
- Henderson, Edward H., Box 5, Mamaroneck, N. Y.

Hubbard, Guy A., 195 Hollis Ave., Braintree, Mass. With Beechnut Packing Co.
 Jones, John H. Address unknown.
 Mason, Amos H., Harding, Mass. Real Estate.
 *Robinson, Frank D. Deceased.
 Taylor, Efford E., 9 Haviland St. Business address c/o A. F. Bannister & Co., New-
 ark, N. J. Traveling Salesman and Farmer.
 *Volio, Enrique T. Reported dead.
 Weed, Dr. Percy L., 65 Buttonwoods Ave. Business address 191 Merrimack St.,
 Haverhill, Mass. Osteopathic Physician.
 Williams, John S., 24 South Main St., Middleboro, Mass.
 Woodbury, Roger A. Address unknown.

1896

ASA S. KINNEY. *Secretary.*

*Burrington, Horace G., $\Phi \Sigma K$. Died at Greenwich, Ct., November, 1907.
 Clapp, Frank L., $\Phi K \Phi$, C.S.C., 195 Boston St., Boston, Mass. Business address
 Room 813, 79 Milk St., Boston, Mass. Civil Engineer.
 Cook, Allen B., C.S.C., Greenwich, Ct.
 deLuce, Edmund, $\Phi \Sigma K$, 2 W. 45th St., New York, N.Y.
 Edwards, Harry T., C.S.C., Bureau of Agriculture, Manila, P. I. Director of Agri-
 culture, Philippine Islands.
 Fletcher, Dr. Stevenson W., $\Phi K \Phi$, C.S.C., Gates Road, Chevy Chase, D. C. Busi-
 ness address Fishersville, Va. M.Sc., Cornell University, 1898; Ph.D.,
 Cornell, 1900. Fruit Grower and Writer.
 Hammar, James F., C.S.C., Nashua, N. H. Farmer and Market Gardener.
 Harper, Walter B., Q.T.V., Box 196, Atlanta, Ga. With Atlanta Gas Light Co.
 *Jones, Benjamin K., C.S.C. Died August 21, 1903, at Springfield Mass.
 Kinney, Asa S., $K \Sigma$, South Hadley, Mass. Floriculturist and Instructor in Botany,
 Mt. Holyoke College. M.Sc., Massachusetts Agricultural College, 1897.
 Kramer, Albin M., $K \Sigma$, 171 Boston Rd., Springfield, Mass. Assistant Engineer,
 Maintenance Dept., Bosch Magneto Company.
 Leamy, Patrick A., Q.T.V., Live Oak, Cal.
 Marshall, James L., C.S.C., 6 Barnard Rd., Worcester, Mass. Business address
 Mountain St., Worcester, Mass. Purchasing Agent, Osgood Bradley
 Car Co.
 Moore, Henry W., $K \Sigma$, 28 Amherst St., Worcester, Mass. Farmer and Market
 Gardener.
 Nutting, Charles A., $\Phi \Sigma K$, West Berlin, Mass. Farmer.
 Pentecost, William L., D.G.K., Chapinville, Conn. Farm Superintendent.
 Poole, Erford W., $\Phi K \Phi$, $K \Sigma$, P. O. Box 129, New Bedford, Mass. Estimator.
 Poole, Dr. I. Chester, $\Phi K \Phi$, $K \Sigma$, 204 High St. Business address 390 Pine St., Fall
 River, Mass. Osteopathic Physician. D.O., American School of Osteo-
 pathy, 1904.
 Read, Frederick H., $\Phi \Sigma K$, Meshanticut Park, R. I. Teacher.
 Roper, Harry H., C.S.C., 20 Linebrook Road, Ipswich, Mass. Farm Manager.
 Saito, Seijiro, C.S.C., 12 Aoyama, Takagicho, Tokyo, Japan. Professor of English
 Language in Nautical College. B.L., Nilson Law School, Tokyo, 1907;
 M.L., 1908.
 Sastre, Salome de Veraud, D.G.K., Cardenas, Tabasco, Mexico. Sugar Planter and
 Manufacturer. New Orleans, La., during Mexican trouble.
 Sellew, Merle E., $\Phi \Sigma K$, East Longmeadow, Mass. Farmer.
 Shaw, Frederick B., $K \Sigma$, Amherst, Mass. Farmer.
 Shepard, Lucius J., C.S.C., West Sterling, Mass. Farmer.
 Shultis, Newton, $K \Sigma$, 14 Winthrop St., Winchester, Mass. Business address 601
 Chamber of Commerce, Boston, Mass. Grain Merchant.
 Tsuda, George, $\Phi \Sigma K$, 213 Honnura Cho, Azabu, Tokyo, Japan. Editor.

NON-GRADUATES

Curley, Dr. Walter J., 48 Concord St., So. Framingham, Mass. Physician.
 Day, Gilbert, 405 Green St., Cambridge, Mass.

Dodge, William B., c/o W. W. Benjamin, Mercantile St., Boston, Mass.
 Geary, Hiram, G. Address unknown.
 Green, Josiah E., Q.T.V., 920 Merchants' National Bank Bldg., San Francisco, Cal. With the Frost Prevention Co.
 Hayward, Ralph L., 16 9th St., Providence, R. I.
 Morse, Sidney L., $\Phi \Sigma K$, Petersburg, N. Y. Author and Publisher.
 *Nichols, Robert P., D.G.K. Deceased.
 Rawson, Herbert W., $\Phi \Sigma K$, Arlington, Mass. Market Gardener.
 *Robinson, Dean F. Died in 1915.
 *Scannell, Michael E. Deceased.
 Shurtleff, Dr. Walter D., Q.T.V., 122 Water St., Plymouth, Mass. Physician and Surgeon. M.D., 1897.
 Stoddard, Samuel H., 408 Union St., Rockland, Mass.
 Vallentine (Mrs. Florence M. Jones), 581 Dwight St., Holyoke, Mass.
 Vaughan, Robert H., R. F. D., Thetford Centre, Vt.
 Walsh, Thomas F., Amherst, Mass.
 Washburn, Frank P., $\Phi \Sigma K$, Perry, Me.

1897

DR. C. A. PETERS, *Secretary*.

Allen, Harry F., C.S.C., Northboro, Mass. Farmer.
 Allen, John W., C.S.C., Northboro, Mass. Hardware Dealer.
 Armstrong, Herbert J., $\Phi \Sigma K$, 11337 Crescent Ave., Morgan Park, Chicago, Ill. Assistant Professor of Civil Engineering, Armour Institute of Technology, Chicago.
 Barry, John M., $\Phi \Sigma K$, 1022 Commonwealth Ave., Brookline, Mass. Business address 26 Green St., Cambridge, Mass. President Ford Used Car Co.
 Bartlett, James L., $\Phi K \Phi$, Q.T.V., South Sudbury, Mass. Florist.
 *Cheney, Dr. Liberty L., Q.T.V. Died September 28, 1915.
 Clark, Lafayette F., C.S.C., 328 Western Ave., Brattleboro, Vt.
 Drew, George A., $\Phi \Sigma K$, Greenwich, Ct. Farm Manager.
 Emrich, Rev. J. Albert, Q.T.V., Williams, Cal. Minister.
 Goessmann, Charles I., D.G.K., 1015 Diamond St., Philadelphia, Pa. Chemist.
 *Leavens, George D., $\Phi K \Phi$, $\Phi \Sigma K$. Died December 21, 1915, at Brooklyn, N. Y.
 Norton, Charles A., $\Phi \Sigma K$, 30 Grove St., W. Lynn, Mass. Business address Henry F. Miller Piano Co., 395 Boylston St., Boston, Mass. Piano Tuner.
 Palmer, Clayton F., C.S.C., 1622 Bushnell Ave., S. Pasadena, Cal. Business address 419 So. Olive St., Los Angeles, Cal. Supervisor of Agriculture, Los Angeles City Schools. M.A., Leland Stanford University, 1905.
 Peters, Dr. Charles A., ΣX , $\Phi K \Phi$, A $\Sigma \Phi$, So. Sunset Ave., Amherst, Mass. Associate Professor of Inorganic and Soil Chemistry, M. A. C. Ph.D., Yale, 1901.
 Smith, Philip H., $\Phi \Sigma K$, 102 Main St., Amherst, Mass. In charge of Feed and Dairy Section, Chemical Department, Massachusetts Agricultural Experiment Station. M.Sc., Massachusetts Agricultural College, 1911.

NON-GRADUATES

Allen, Edward B., Mt. Lebanon, N. Y. Farm Superintendent.
 Barclay, Frederick W., West Riverside Drive, Indianapolis, Ind. R. R. 19. Superintendent Wheeler Estate.
 Birnie, Alexander C., $\Phi \Sigma K$, Ludlow, Mass.
 Charmbury, Dr. Thomas H., Q.T.V., Broadway, Hanover, Pa. Dentist.
 Colby, Fredrick William, D.G.K., 440 Newbury St., Boston, Mass.
 Coleman, Robert P., R. R. No. 1, Pittsfield, Mass. Farmer.
 Cook, Maurice E., Shrewsbury, Mass. Florist and Market Gardener.
 Eddy, John R., $\Phi \Sigma K$, 1004 Murchison Bldg., Wilmington, N. C. Architect and Engineer.
 Falby, Francis R., Northboro, Mass.
 Farnsworth, Robert L., Turners Falls, Mass. Mill Superintendent.
 Pittz, Austin H., Norwood, Mass. Superintendent of Schools.

Howe, Herbert F., Q.T.V., Guayaquil, Ecuador, S. A.
 Hunter, Herbert C., R. R. No. 1, East Falls Church, Va. Agricultural Meteorology, A.B., Harvard 1898.
 *King, Charles A., Q.T.V. Died April, 1896, at College.
 Mansfield, Dr. George R., $\Phi \Sigma \K$, 2067 Park Road. Business address U. S. Geology Survey, Washington, D. C. Geologist, U. S. Geology Survey. A.B., Amherst College, 1897; A.M., Harvard University, 1904; Ph.D., Harvard, 1906.
 *Millard, Frank C. Died July 11, 1911.
 Nowell, Allen M., 2013 McKinley St., Honolulu, T. H. Secretary and Manager Sugar Factors Company, Ltd.
 Palmer, Edward D., Upland, Cal. Fruit Grower.
 Ranlett, Charles A., Billerica, Mass. Business address Box 3046, Boston, Mass. Military Instructor in Boston High Schools.
 Roberts, Percy C., Greenfield, Mass.
 Sherman, Carleton F. McComb, Miss. Civil Engineer.
 Sherman, Harry R., Dartmouth, Mass.
 Stearns, Harold E., 496 Chestnut St., Arlington, N. J. Veterinary Surgeon.
 West, Harold L. Address unknown.

1898

W. S. FISHER, *Secretary*.

Adjemian, Avedis G., D.G.K., Adana, Eastern Turkey, c/o Rev. H. N. Barnum.
 Baxter, Charles N., C.S.C., Branford, Ct. Librarian, Blackstone Memorial Library. A.B., Harvard, 1902.
 Clark, Clifford G., D.G.K., Sunderland, Mass. Farmer.
 Eaton, Julian S., D.G.K., Nyack-on-Hudson, N. Y. Business address 141 Broadway, New York, N. Y. Lawyer. B.L., 1913; LL.B., University of Minnesota, 1904.
 Fisher, Willis S., $\Phi \Sigma \K$, 251 Niagara St., Providence, R. I. Principal Peace St. Grammar School.
 Montgomery, Alexander W., C.S.C., Hadley, Mass. Florist.
 Nickerson, Dr. John P., Q.T.V., West Harwich, Mass. Physician. Representative Massachusetts General Court, 1914-1916. M.D., Tufts Medical School, 1901.
 Warden, Randall D., $\Phi \Sigma \K$, 67 Treacy Ave. Business address City Hall, Newark, N. J. Director Physical Training, Public Schools.
 Wiley, Samuel W., $\K \Sigma$, 5 So. Gay St., Baltimore, Md. President, Wiley & Co., Analytical and Consulting Chemists.
 Wright, George H., $\Phi \Sigma \K$, 282 McDonough St., Brooklyn, N. Y. Bookkeeper.

NON-GRADUATES

*Holt, Henry D. Died August 5, 1896.
 Kinsman, Willard Q., 23 Fellows Rd., Ipswich, Mass. Farmer.
 Thompson, G. Harris A., Q.T.V., 3 Courtland St., Worcester, Mass. Foreman
 Wolcott, Herbert R., $\Phi \Sigma \K$, 26 Irvington St. Business address 164 Dwight St., Springfield, Mass. Local Manager, Crane Co.

1899

DAN A. BEAMAN, *Secretary*.

Armstrong, William H., $\Phi \Sigma \K$, Henry Barracks, Cayey, P. R. Captain in U. S. Army.
 Beaman, Dan A., Q.T.V., Rio Piedras, P. R. Farm Superintendent.
 Chapin, William E., $\Phi \Sigma \K$, 4 Clifton St., Portland, Me. Teacher, Portland High School.
 Dana, Herbert W., C.S.C., 9 Oliver St., Salem, Mass. Business address Paine Furniture Co., Boston, Mass. Advertising Manager.

Hinds, Dr. Warren E., Φ K Φ , A Σ Φ , Auburn, Ala. Professor of Entomology Alabama Polytechnic Institute, and Entomologist, Alabama Agricultural Experiment Station. Ph.D., M. A. C., 1902.

Hooker, Dr. William A., Φ Σ K, 223 Willow Ave., Takoma Park, D. C. Business address States Relations Service, United States Department of Agriculture Washington, D. C. Assistant Editor Experiment Station Record. D.V.M., 1913.

Hubbard, George C., Φ Σ K, Sunderland, Mass. Farmer.

Maynard, Howard E., C.S.C., 200 Calvert Ave., Detroit, Mich.

Merrill, Frederick A., Athens, Ga. Professor of Economics, Georgia State Normal School. Editor of *Progress*.

Pingree, Melvin H., C.S.C., 2343 S. Clinton St., Baltimore, Md. Chemist.

Smith, Bernard H., Φ K Φ , C.S.C., 17 Beaumont St. Business address 382 Bridge St., Springfield, Mass. Chemist and Superintendent, Baker Extract Co. M.S., George Washington University, 1903, LL.B., National University, 1905.

Smith, Samuel E., C.S.C., Westboro, Mass. Farmer.

Turner, Frederick H., Φ K Φ , C.S.C., Great Barrington, Mass. Hardware Merchant.

Walker, Charles M., C.S.C., 100 W. 90th St., New York, N. Y. Business address 131 E. 23d St., New York, N. Y. Manager Slide Dept., Charles Beseler Co.

NON-GRADUATES

Boutelle, Albert A., Φ Σ K, Canton, Mass. Farm Manager.

Chapman, John C. Address unknown.

Courtney, Howard S., C.S.C., Greenport, Long Island, N. Y. Florist.

Davis, John A., D.G.K., 36 Groveland St. Business address Room 310 City Hall, Springfield, Mass. Deputy City Forester.

Dickinson, Carl C., Q.T.V., 200 West 31st St., Los Angeles, Cal. Telegrapher.

Dutcher, John R., D.G.K., Nyack, N. Y.

Gile, Alfred D., D.G.K., 319 E. 60th St., Portland, Ore.

Keenan, Dr. George F., Q.T.V., 11 Menlo St., Brighton District. Business address 520 Beacon St., Boston, Mass. Physician. M.D., '06.

Sharpe, Edward H., D.G.K., 811 N. Market St., Frederick, Md. Salesman.

Smith, Carl W., Eaton Rapids, Mich.

Stacy, Clifford E., Q.T.V., Ben Bolt, Texas. (Nueces County.)

Wright, Edwin M., Φ Σ K, Manteno, Ill.

1900

E. K. ATKINS, Secretary.

Atkins, Edwin K., K Σ , 15 Hubbard Ave., Northampton, Mass. Civil Engineer.

Baker, Dr. Howard, C.S.C., 69 Fountain St. Business address c/o The Sperry & Barnes Co., New Haven, Ct., Veterinary Inspector, U. S. Dept. A., Bureau of Animal Industry. M.D.V., University of Pennsylvania, 1902.

Brown, F. Howard, K Σ , Hosmer St., Marlboro, Mass. Farmer. Secretary Massachusetts Fruit Grower Association.

Campbell, Morton A., C.S.C., Townsend, Mass.

Canto, Ysidro H., D.G.K., Causaheub, Yucantan, Mexico.

Crane, Henry L., Φ Σ K, Westwood, Mass. Farmer.

*Felch, Percy F., C.S.C. Died in North Hadley, July 8, 1900.

Frost, Arthur F., C.S.C., 1364 E. 17th St., Brooklyn, N. Y. Business address Public Service Commission, 154 Nassau St., New York, N. Y. Civil Engineer.

Gilbert, Dr. Ralph D., A Σ Φ , 9 Ridgfield Rd., Winchester, Mass. Business address 43 Chatham St., Boston, Mass. Vice-President and General Manager, Bowker Insecticide Co. Ph.D., Yale, 1904.

Halligan, James E., K Σ , Box 246, Baton Rouge, La. Chemist, State Experiment Station.

*Harmon, Dr. A. A., Φ K Φ , C.S.C. Died November, 1910.

- Hull, Dr. Edward T., Φ K Φ , C.S.C., 258 West 139th St., New York City. Physician. M.D., Columbia University, 1904.
- Kellogg, James W., Φ Σ K, Old Orchard, Harrisburg, Pa. Business address Box "R," Bureau of Chemistry, Harrisburg, Pa. Chief Chemist, Pennsylvania Department of Agriculture.
- Landers, Dr. Morris B., D.G.K., 79 Washington Blvd., Detroit, Mich. Physician and Surgeon. M.D., Detroit Medical College.
- Lewis, James F., Φ Σ K. Address unknown.
- Monahan, Arthur C., Φ K Φ , C.S.C., 132 Bryant St., N. W. Business address Bureau of Education, Washington, D. C. Specialist in Agricultural Education.
- Morrill, Dr. Austin W., Φ Σ K, Phoenix, Ariz. State Entomologist, Arizona Agricultural Experiment Station. Ph.D., Massachusetts Agricultural College, 1903.
- Munson, Mark H., C.S.C., Lenox, Mass. Poultry Farm Superintendent.
- Parmenter, Dr. George F., Φ Σ K, 3 Sheldon Place, Waterville, Me. Professor of Chemistry, Colby College. M.A., Ph.D., Brown University, 1903.
- Stanley, Dr. Francis G., Q.T.V., 144 Cabot St., Beverly, Mass. Surgeon. M.D., Harvard University, 1904.
- West, Albert M., Φ Σ K, Department of Agriculture, Bureau of Animal Husbandry, Washington, D. C.

NON-GRADUATES

- Crowell, Charles A., Jr., Φ Σ K, Vineyard Haven, Mass. Superintendent of Schools. B.S., Harvard University.
- Crowell, Warner R., 10 Medford St., Boston, Mass. Real Estate.
- March, Allen L., Φ Σ K, Gen. Del., Springfield, Mass.
- Otis, Wilbur C. Address unknown.
- Risley, Clayton E., Φ Σ K, Hamilton, N. Y. Seedsman and Florist.
- Rogers, William B., Q.T.V. Address unknown.
- Walker, Henry E. Vineyard Haven, Mass.

1901

J. H. CHICKERING, *Secretary*.

- Barry, John C., K Σ . Address unknown.
- Bridgeforth, George R., C.S.C., Tuskegee Institute, Tuskegee, Alabama. Director Agricultural Department.
- Brooks, Percival C., Φ Σ K, 239 West 16th St., Chicago Heights, Ill. Assistant Superintendent, Illinois Works of General Chemical Co.
- Casey, Thomas, Q.T.V., 336 Main St., Fitchburg, Mass. Lawyer.
- Chickering, James H., Φ Σ K, Dover, Mass. Superintendent, E. F. Hodgson Co.
- Cooke, Theodore F., C.S.C., 181 Elm St., Pittsfield, Mass. Teacher of Mathematics, Pittsfield High School.
- Dawson, William A., C.S.C., 16 Johnston Ave., Willimantic, Ct. Florist.
- Dickerman, William C., Φ Σ K. Address unknown.
- Gamwell, Edward S., C.S.C. Address unknown.
- Gordon, Dr. Clarence E., Σ X, Φ K Φ , C.S.C., Amherst, Mass. Associate Professor of Zoölogy and Geology, Massachusetts Agricultural College. A.M., Columbia University, 1905. Ph.D., Columbia University, 1911.
- Graves, Thaddeus, Jr., Φ Σ K, Hatfield, Mass. Farmer.
- Henry, James B., D.G.K., 50 State St., Hartford, Ct., LL.B. University of Michigan, 1904. Lawyer.
- Hunting, Nathan J., C.S.C., Shutesbury, Mass. Farmer.
- Leslie, Dr. Charles T., C.S.C., Pittsfield, Mass. Physician. M.D., Columbia University, 1905.
- Macomber, Ernest L., Φ Σ K, Wareham, Mass. Station Agent.
- Ovalle, Julio, D.G.K. Address unknown.
- Pierson, Wallace R., Φ K Φ , K Σ , Cromwell, Ct. Secretary and Assistant Treasurer of A. N. Pierson, Inc. Wholesale Florists.

Rice, Charles L., C.S.C., Western Electric Co., N. Woolwich, London, England.
Works Manager.
Root, Luther A., $\Phi \Sigma K$, R. R. No. 2, Lowell, Mass. Dairy Farm Foreman.
Shaffrath, Max, Coalinga Cal. Superintendent, P. L. Dept., Standard Oil Co.
Smith, Ralph I., Q.T.V., Mayaguez, Porto Rico. Professor of Zoölogy and Entomology, College of Agriculture and Mechanic Arts.
Tashjian, Dickran B., Q.T.V., Turner Hill, Ipswich, Mass. Landscape Gardener.
Todd, John H., Q.T.V. Address unknown.
Whitman, Nathan D., $\Phi \Sigma K$, 5608 Wabash Ave. Business address 322 Michigan Blvd., Chicago, Ill. Engineer and Manager.
Wilson, Alexander C., $\Phi K \Phi$, $\Phi \Sigma K$, Room 809, 57 Post St., San Francisco, Cal. Consulting Civil Engineer.

NON-GRADUATES

Baker, John B., 53 Bonn Place, Weehauken, N. J.
Boutelle, Clarence A., $\Phi \Sigma K$, Mohawk, N. Y. Farm Superintendent and Instructor in Animal Husbandry, Cornell University Extension Department.
*Clarke, George C., Q.T.V. Died April 18, 1900.
Curtis, Ernest W., Q.T.V., 221 E. 2nd. St., Jacksonville, Fla.
Dana, George H., Amherst, Mass. Farmer.
Dorman, Allison R., $\Phi \Sigma K$, 15 Maple St., New Bedford, Mass. Teacher in High School.
Greeley, Dana S. B. Address unknown. Travelling in South America, 1916.
Gurney, Victor H., $\Phi \Sigma K$. Address unknown.
Hemenway, Francis E. Address unknown.
Howard, John H., $\Phi \Sigma K$, Westford, Mass. P. O., Littleton Common, Mass. Farmer.
Jones, Clark W. Address unknown.
Jones, Cyrus W., D.G.K., Box 476, Siloam Springs, Ark. Teacher. S.B., Harvard University.
Judd, Warren H., South Hadley, Mass. Farmer.
Moulton, Harry J., $\Phi \Sigma K$, 120 E. 4th St., Los Angeles, Cal. Salesman.

1902

H. L. KNIGHT, *Secretary*.

Belden, Joshua H., $\Phi \Sigma K$, 406 Ellicot Sq., Buffalo, N. Y.
Bodfish, Henry L., D.G.K. Address unknown.
Carpenter, Dr. Thorne M., $\Phi K \Phi$, C.S.C., 103 Francis St. Business address, Nutrition Laboratory, Fenway, Boston, Mass. Chemist for Carnegie Institution. Ph.D., Harvard, 1915.
*Church, Frederick R., C.S.C. Died at Queens, Long Island, N. Y., March 17, 1910.
Clafin, Leander C., $\Phi \Sigma K$, 5826 Woodbine Ave. Business address, 1107 Chestnut St., Philadelphia, Pa. Merchant.
Cook, Lyman A., Q.T.V., Groton, Mass. Farm Superintendent.
Cooley, Orrin F., 716 Cahuenga Ave. Business address, Hall of Records, Los Angeles, Cal. Civil Engineer.
Dacy, Arthur L., $\Phi K \Phi$, C.S.C., Morgantown, W. Va. Associate Horticulturist, West Virginia Agricultural Experiment Station and Associate Professor of Horticulture, W. V. U. College.
Delea, John M., C.S.C., R. F. D., Alford. Address R. R. Great Barrington, Mass. Farmer.
Dwyer, Chester E., C.S.C., Nebraska City, Neb. Farm Manager.
Gates, Victor A., $\Phi \Sigma K$, Lonoke, Ark. With Gates Mercantile Co.
Hall, John C., $\Phi \Sigma K$, South Sudbury, Mass. Business address, Cambridge, Mass. Teacher.
Hodgkiss, Harold E., C.S.C., 90 Lyceum St., Geneva, N. Y. Assistant Entomologist, New York Agricultural Experiment Station.
Kinney, Charles M., $\Phi \Sigma K$, 330 Webster Ave., Chicago, Ill.

- Knight, Howard L., $\Phi K \Phi$, A $\Sigma \Phi$, 1420 Buchanan St. Business address, States Relations Service, U. S. Department of Agriculture, Washington, D. C. Assistant Editor, *Experiment Station Record*.
- Lewis, Claude I., C.S.C., 754 Jefferson St., Corvallis, Ore. State Horticulturist and Professor of Horticulture, Oregon State University and Agricultural Experiment Station. M.Sc., Agriculture, Cornell University, 1906.
- Morse, Ransom W., Q.T.V., 11 Forbes St., Poughkeepsie, N. Y. Manager of Publicity, A. C. Dutton Lumber Corporation. M.Sc., Dartmouth, 1907.
- Paul, Herbert A., C.S.C. Address unknown.
- Plumb, Frederick H., D.G.K., 4809 Walnut St. Business address, 1710 Market St., Philadelphia, Pa. Sales Manager.
- Saunders, Edward B., D.G.K., 133 Amherst St., Nashua, N. H. President E. B. Saunders & Co.
- Smith, S. LeRoy, C.S.C., 379 Hillside Ave. Business address, 107 Halsey St., Newark, N. J. Secretary, Y. M. C. A.
- West, D. Nelson, Q.T.V., 418½ Lewis Ave., Brooklyn, N. Y. Business address, Department of Public Works, Manhattan, New York, N. Y. Civil Engineering Designer.

NON-GRADUATES

- Adams, Edward E., $\Phi \Sigma K$, Millis, Mass.
- *Ball, George T. Died March 15, 1910.
- Chapin, Warren L. Address unknown.
- Chase, William J. Address unknown.
- Cole, William R., Q.T.V., 20 Rupert St. Business address, Forest Park School, Springfield, Mass. Instructor, Manual and Prevocational Training.
- Greenman, Fred H. Address unknown.
- Hanlon, Dr. Harold C., D.G.K., North Easton, Mass. Dentist.
- Holder, Walter S., C.S.C., Chelmsford, Mass. Farmer.
- James, Harold F. Address unknown.
- James, Hubert C. Address unknown.
- McCobb, Edmund F., $\Phi \Sigma K$, Milford, Mass.
- Peabody, Harry E., C.S.C., 811 Warren Ave. Business address, 823 North Main St., Brockton, Mass. Postal Clerk.
- Walker, Alpheus H., Millbrook, Mass. Poultryman.
- Warden, James K., $\Phi \Sigma K$, 522 W. 36th St., New York, N. Y. Contractor.

1903

G. D. JONES, *Secretary*.

- Allen, William E., $\Phi \Sigma K$, 416 American Bank Building, Seattle, Wash. (1910).
- Bacon, Stephen C., K Σ , 64 Rutgers Ave. Business address, City Hall, Jersey City, N. J. Civil Engineer for City.
- Barrus, George L., K Σ , Lithia, Mass. Farmer.
- Bowen, Howard C., R. D. 1 Box 216, Fairview, Ore.
- Brooks, Philip W., Q.T.V., Holtville, Cal. Farmer.
- Cook, Joseph G., $\Phi K \Phi$, C.S.C., R.R., Amherst, Mass.
- Franklin, Dr. Henry J., $\Phi K \Phi$, Q.T.V., E. Wareham, Mass. Superintendent, Cranberry Sub-station of Massachusetts Agricultural Experiment Station. Ph.D., Massachusetts Agricultural College, 1908.
- Halligan, Charles P., K Σ , Oak Hill Ave., East Lansing, Mich. Assistant Professor of Horticulture, Michigan Agricultural College.
- Harvey, Lester F., C.S.C., Hingham, Mass. Farm Superintendent.
- Hood, William L., Boley, Okla., Creek-Seminole College.
- Jones, Gerald D., Q.T.V., North Amherst, Mass. Farmer.
- Lamson, George H., Jr., C.S.C., Storrs, Ct. Professor of Zoölogy, Connecticut Agricultural College; M.Sc., Yale University, 1905.
- Monohan, Neil F., C.S.C. Address unknown.
- Nersessian, Paul N., Marash, Turkey.

- Osmun, A. Vincent, Φ K Φ , Q.T.V., 5 Kendrick Place, Amherst, Mass. Associate Professor of Botany, Massachusetts Agricultural College. M.Sc., Massachusetts Agricultural College, 1905.
- Parsons, Albert, Q.T.V., North Amherst, Mass. Milk Dealer and Farmer.
- Peebles, W. W. Address unknown.
- Poole, Elmer M., K Σ , North Dartmouth, Mass. Farmer.
- Proulx, Edward G., Φ Σ K, Lafayette, Ind. Chemist, Indiana Agricultural Experiment Station. M.Sc., Agriculture, Purdue University, 1909.
- *Robertson, R. H., K Σ . Died December 10, 1904, at Amherst.
- Snell, Edward B., Q.T.V., 24 High St. Business address, Second National Bank Bldg., New Haven, Ct. Civil Engineer.
- Tinkham, Charles S., D.G.K., 24 Pond St. Business address, Davenport Bldg., Greenfield, Mass. Resident Engineer, Massachusetts Highway Commission.
- Tottingham, Dr. William E., Φ K Φ , Q.T.V., 612 Howard Pl., Madison, Wis. Professor and Research Assistant in Agricultural Chemistry, Chemical Department, University of Wisconsin. M.Sc., University of Wisconsin, 1908. Ph.D.
- Tower, Winthrop V., Φ Σ K, San Juan, Porto Rico. Entomologist, Porto Rico Agricultural Experiment Station.
- West, Myron H., Q.T.V., Marquette Building, Chicago, Ill. President, American Park Builders, Inc.

NON-GRADUATES

- Allen, Miss Lilly B. Address unknown.
- Blake, Ernest E., D.G.K., Gill, Mass. Farmer.
- Bowler, Patrick H. Address unknown.
- *Carmody, John F. Deceased.
- Cheever, Herbert M. Address unknown.
- Dillon, James H. Address unknown.
- Harris, Fredrick A., R. F. D., Amherst, Mass. Farmer.
- Higgins, Willis E. Address unknown.
- Kelly, Herbert T., Φ Σ K, Bellows Falls, Vt. Secretary, Robertson Paper Co.
- Martin, Henry T., C.S.C., Fearing St., Amherst, Mass. Post Office Clerk.
- Parsons, Josiah W., 128 Bridge St., Northampton, Mass. Farmer.
- Perkins, Edward L., Φ Σ K, 34 Eaton St, Winchester, Mass. Salesman.
- Phelps, Arthur A., Northboro, Mass.
- Phillips, Lee, D.G.K., Terrace Ave., Carnegie, Pa. Business address, National Radiator Co., Johnstown, Pa. Salesman. B.S., Massachusetts Institute of Technology.
- Potter, Roland D. Address unknown.
- Richardson, Dr. Harlan L., D.G.K., 58 Main St., Winter Hill, Mass. Business address, Room 413 Huntington Chambers, Boston, Mass. Osteopathic Physician. D.O., Massachusetts College of Osteopathy, 1915.
- Thompson, Leslie I., Allenton, R. I. Fruit Grower.
- Tinker, Clifford A., K Σ , 465 Sumner Ave. Business address, 318 Main St., Springfield, Mass. Architect and Engineer.
- Vance, Phillip G., 22 Allen St., Bradford, Mass. Business address, 120 Washington St., Haverhill, Mass. Pattern Maker.
- *Webster, Frank W. Died in Chicago, Ill. Date unknown.
- Wollheim, Ernest. Address unknown.

1904

P. F. STAPLES, *Secretary*.

- Ahearn, Michael F., A Σ Φ , 507 Laramie St., Manhattan, Kans. Professor of Landscape Gardening, Kansas Agricultural College. M.S., Kansas State Agricultural College, 1913.

- Back, Dr. Earnest A., Φ K Φ , C.S.C., Bureau of Entomology, U. S. Department of Agriculture. Entomologist. Ph.D., Massachusetts Agricultural College, 1907.
- Blake, Maurice A., Q.T.V., 124 Hamilton St., New Brunswick, N. J., Horticulturist, New Jersey Agricultural Experiment Station. Professor of Horticulture, Rutgers College.
- Couden, Fayette D., Φ K Φ , Φ Σ K, 424 First St., South Bend, Wash. Business address, First International Bank Bldg., South Bend, Wash. Lawyer. LL.B., 1908.
- Elwood, Clifford F., K Σ , 2628 Durant Ave., Berkeley, Cal. Business address, Budd Hall, University of California, Berkeley, Cal. Instructor, Division of Agricultural Education.
- Fulton, Erwin S., C.S.C., North Amherst, Mass. Farmer.
- Gilbert, Dr. Arthur W., Σ X, Φ K Φ , A Σ Φ , 408 Dryden Rd., Ithaca, N. Y. Professor of Plant Breeding, Cornell University. M.Sc., Agriculture, Cornell University, 1905; Ph.D., Cornell University, 1909.
- Gregg, John W., A Σ Φ , 2249 Glenn Ave., Berkeley, Cal. Professor of Landscape Gardening, and Floriculture, University of California.
- Griffin, Dr. Clarence H., Φ Σ K, 1820 North Normandie Ave., Los Angeles, Cal. Business address, 752 South Los Angeles St., Los Angeles, Cal. Director, California Testing Laboratory. M.D., George Washington University, 1909.
- Haskell, Sidney B., Φ K Φ , A Σ Φ , North Amherst, Mass. Professor of Agronomy Massachusetts Agricultural College.
- Henshaw, Fred F., Φ K Φ , C.S.C., 490 E. 48th St., N., Portland, Ore. Business address, 416 Couch Bldg., Portland, Ore. Hydraulic Engineer, U. S. Geological Survey.
- Hubert, Zachary T. President Jackson College, Jackson, Miss.
- Newton, Dr. Howard D., A Σ Φ . Head of Department of Chemistry, Connecticut Agricultural College, Storrs, Ct. Ph.D., Yale, 1908.
- O'Hearn, George E., C.S.C., Box 1385, Pittsfield, Mass. Landscape Forester.
- Parker, Sumner R., C.S.C., 45 Amity St., Amherst, Mass. Assistant State Leader, Massachusetts Agricultural College Extension Service.
- Peck, Arthur L., Φ K Φ , C.S.C., College Crest, Corvallis, Ore. Associate Professor of Landscape Gardening and Floriculture, Oregon State College.
- Quigley, Dr. Raymond A., C.S.C., 615 Warren Ave., Everett, Wash. Physician. M.D., Harvard Medical School, 1908.
- Raymouth, R. Raymond, K Σ . Address unknown.
- Staples, Parkman F., A Σ Φ . Manager Stannox Farm, East Holliston, Mass.
- White, Howard M., Φ K Φ , Φ Σ K, Hilton, N. Y. Fruit Grower.

NON-GRADUATES

- Baker, Perez R., Q.T.V., 36 High St., Amherst, Mass. Farmer.
- Collins, Joseph D., Q.T.V. Address unknown.
- Copeland, William W. Address unknown.
- Cummings, John F. Address unknown.
- Ellsworth, Frank L., Q.T.V. Address unknown.
- *Esip, Edward T. Deceased, 1902.
- Fahey, John J., C.S.C., 16 Myrtle St., Pittsfield, Mass. Postal Clerk.
- Graves, George A. Address unknown.
- Haffenreffer, Adolf F., Φ Σ K, 866 Davol St., Fall River, Mass. Brewer.
- Handy, Robert S., C.S.C., Cataumet, Mass. Farmer.
- *Hill, Louis W. B. Deceased.
- Kelleher, Justin, Q.T.V., 19 Newton St. Business address, 73 Main St., Brockton, Mass.
- Kirby, Daniel W., Thompson, Ct.
- Pease, James A., 98 Courtland St., Bridgeport, Ct. Real Estate.
- Pierce, Hervey C., Millbury, Mass. Merchant.
- Richardson, Charles H., Boxboro, Mass.
- Ryan, Arthur. Address unknown.
- Sawin, Ralph D. Address unknown.

Smith, Walter A., $\Phi \Sigma K$. Address unknown.
 Thompson, Clarence L., $\Phi \Sigma K$, 117 Clyde Rd., Watertown, Mass.
 Witherell, Geo. A., Warwick, Mass. Market Gardener and Fruit Grower.
 Witt, Henry H., Q.T.V., Federal St., Belchertown, Mass. Farmer.

1905

A. D. TAYLOR, *Secretary*.

- Adams, Richard L., $\Phi K \Phi$, 11 Budd Hall, University of California, Berkeley, Cal.
 Professor of Farm Management and Assistant Professor of Agronomy.
 Allen, G. Howard, $\Phi \Sigma K$, 1015 So. Los Angeles St., Los Angeles, Cal. Sales Agent,
 Rotary Machinery Co.
 Barnes, Hugh L., A $\Sigma \Phi$, Interlaken, Stockbridge, Mass. Farmer.
 Bartlett, Francis A., $\Phi \Sigma K$, 570 Maud St., Stamford, Ct. President and Treasurer,
 Frost and Bartlett Co. Vice-President Oasis Farm and Orchard Co.,
 Roswell, N. M. Editor and Publisher of *Tree Talk*.
 Crosby, Harvey D., Q.T.V., Princeton, Mass. Farm Superintendent.
 Cushman, Miss Esther C., $\Phi K \Phi$, 61 Barnes St. Business address, 21 Brown St.,
 Providence, R. I. Assistant at Ammary Brown Memorial Library.
 Gardner, John J., A $\Sigma \Phi$, 1117 Euclid St., Champaign, Ill. Associate in Pomology,
 College and Experiment Station, University of Illinois. M.S., Univer-
 sity of Illinois, 1914.
 Gay, Ralph P., $\Phi \Sigma K$, 316 E. Front St., Plainfield, N. J. Tree Surgeon.
 Hatch, Walter B., C.S.C., 135 Southworth St., West Springfield, Mass., Construction
 Engineer.
 Holcomb, C. Sheldon, K Σ , 98 Phillips St., Wollaston, Mass. Business address, 320
 Pierce Building, Copley Square, Boston, Mass. Teacher of Voice at
 Curry School of Expression.
 Hunt, Thomas F., C.S.C., 2429 Channing Way, Berkeley, Cal. Extension Worker,
 College of Agriculture, University of California.
 Ingham, Norman D., C.S.C., Atascadero, Cal. Silviculturist.
 Kelton, J. Richard, K Σ , 34 Pearl St., Amsterdam, N. Y. Teacher Amsterdam High
 School.
 Ladd, Edward T., K Σ , 207 Cornell Ave., Swarthmore, Pa. Chief Chemist, Baugh
 & Sons Co., Philadelphia, Pa. M.Sc., Massachusetts Agricultural Col-
 lege, 1907.
 Lewis, Clarence W., Q.T.V., 43 Lynde St., Melrose, Mass. Farm Superintendent,
 Long Island Hospital, Boston.
 Lyman, Dr. J. E., $\Phi K \Phi$, K Σ , Clintonville, Ohio. Professor of Agricultural Chem-
 istry, Ohio State University, Columbus, Ohio. Ph.D., Yale University,
 1909. President Columbus Section, American Chemical Society.
 Munson, Willard A., $\Phi K \Phi$, $\Phi \Sigma K$, Dedham, Mass. Agent, Norfolk County Farm
 Bureau.
 Newhall, Edwin W., Jr., D.G.K., 260 California St., San Francisco, Cal. Farmer,
 with H. M. Newhall and Co.
 Patch, G. Willard, $\Phi K \Phi$, $\Phi \Sigma K$, 104 Kingston St., Boston, Mass. Purchasing
 Agent for Drown Durrell Co., Boston, Mass.
 Sanborn, Monica L. (Mrs. William O. Taft), $\Phi K \Phi$, P. O. Box 94, Sterling, Mass.
 Sears, William M., $\Phi \Sigma K$, Elm Place, Stamford, Ct. Sales Manager, Frost and Bart-
 lett Co., 570 Main St., Stamford, Ct.
 Swain, Allen N., $\Phi \Sigma K$, 15 Merlin St., Dorchester Center, Mass. Business address,
 1132 and 1133 Tremont Bldg., Boston, Mass. Horticulturist, and Dis-
 trict Manager of Munson-Whitaker Co.
 Taylor, Albert D., $\Phi K \Phi$, A $\Sigma \Phi$, 7309 Hough Ave. Business address, 1900 Euclid
 Ave., Cleveland, Ohio. Landscape Architect. Nonresident Professor
 at Ohio State University. M.Sc., Agriculture, Cornell University, 1906.
 Tompson, Harold F., $\Phi K \Phi$, K Σ , 10 Temple St., Arlington, Mass. Professor of
 Market Gardening, Massachusetts Agricultural College.
 Tupper, Bertram, $\Phi K \Phi$, K Σ , Plymouth County Farm Bureau, Brockton, Mass.

- Walker, Lewell S., A Σ Φ , 19 Phillips St., Amherst, Mass. Assistant Chemist, Massachusetts Agricultural Experiment Station.
- Whitaker, Chester L., Φ Σ K, 443 Homestead Ave., Mt. Vernon, N. Y. Business address, 470 Fourth Ave., New York, N. Y. President, Munson Whitaker Company, New York, N. Y., Commercial and Landscape Foresters.
- *Williams, Percy F., K Σ . Died December 4, 1912, at Auburn, Ala.
- Willis, Grenville N., Φ K Φ , Φ Σ K, 167 W. Housatonic St., Pittsfield, Mass. Business address, 106 Agricultural Bank Bldg., Pittsfield, Mass. Civil Engineer, District Engineer with Mass. Highway Commission. In charge of Southern Berkshire District.
- Yeaw, Frederick L., Φ Σ K, Roswell, New Mexico. General Manager Oasis Farm & Orchard Co., Inc. Editor of "*Market Gardening*."

NON-GRADUATES

- Belden, William L. Address unknown.
- Brett, Clarence E. Φ Σ K, Brooklawn Farms, Morris Plains, N. J. Poultry Husbandman.
- Brigham, Fred W. Address unknown.
- Bruce, Ernest C., Home address, 26 Blake St., Westboro, Mass.
- Carter, Chester M., Q.T.V., Barre, Mass. Florist.
- Goodenough, Herbert H. Address unknown.
- Graves, Edwin L., Hatfield, Mass.
- *Hamblin, John H. Died March 20, 1905.
- Huntington, Raymond E., 60 Willow St., Wollaston, Mass. Business address, 140 Sixth St., Cambridge, Mass. Advertising Manager of Alden-Speare's Sons Co; Assistant Treasurer, *Atlantic Press*. Secretary, Pilgrim Publicity Association.
- Knight, John H. Address unknown.
- Ladd, Joseph, Jr. Address unknown.
- Lyman, Richard R., Montague, Mass. Farmer.
- Merrill, Charles E., Jr., Q.T.V., 421 Essex St., Salem, Mass. With H. P. Hood & Sons.
- O'Neil, William J., 28 Eastern Ave., Beverly, Mass. Instructor in Manual Training, Industrial School for Deaf and Dum
- Paul, A. R., Market St., Belvidere, N. J. Fruit Grower. President Delaware Valley Coöperative Association; Chairman, Warren Co. Fair Comm., Belvidere, N. J.; Editor of "Apple Diseases of New Jersey."
- *Peck, Louis E. Died early in 1912.
- Porter, Charles A. Address unknown.
- Ransehousen, Lyman A., Φ Σ K, 147 Belmont Ave., Springfield, Mass. Manufacturer.
- Rhodes, Elmer E., 49 Peck St., Providence, R. I.
- Richardson, Justus C., Φ Σ K, 701 Mammothe Rd., Dracut, Mass. Business address, Lowell, Mass. Market Gardener.
- Smith, Robert E., South Hadley Falls, Mass. Farmer.
- Sprague, Charles E., c/o Utah Power & Lighting Co., Provo, Utah.
- Straw, Harold D. Address unknown.
- Sykes, Charles S., K Σ , 10 Elm Circle, West Springfield, Mass. Motorman.
- *Tinkham, Henry B. Died June 23, 1914.
- Walsh, Thomas F., So. Lancaster, Mass. Business address, 64 India St., Boston, Mass. Traveling Salesman.
- Williams, Franklin K. Address unknown.

1906

RICHARD WELLINGTON, *Secretary*.

- Carey, Daniel H., Q.T.V., University of California Conservatory, Berkeley, Cal. Nurseryman; Instructor in Floriculture.
- Carpenter, Charles W., Φ K Φ , K Σ , Monson, Mass. Farmer.

Craighead, William H., 10 S. Court Ave., Harrisburg, Pa. Editor.
 Filer, Harry B., 13 City Hall, Buffalo, N. Y. City Forester.
 French, G. Talbot, Φ K Φ , Φ Σ K, 1103 E. Main St., Richmond, Va. State Seed Expert.
 Gaskill, Edwin F., A Σ Φ , Amherst, Mass. Assistant Agriculturist, Massachusetts Agricultural Experiment Station.
 Hall, Arthur W., Jr., Φ Σ K, Amherst, Mass. Lawyer.
 Hastings, Addison T., Jr., Q.T.V., 168 Grant Ave., Jersey City, N. J. City Forester.
 *Hood, Clarence E., Q.T.V. Died June 18, 1912, at Champaign, Ill.
 Kennedy, Frank H., C.S.C., 127 Newbury St. Business address, 115 Liberty St., Brockton, Mass. City Chemist and Bacteriologist.
 Martin, James E., A Σ Φ , Leadville, Col. U. S. Forest Service. M.F., Harvard, 1908.
 Moseley, Louis H., C.S.C., Glastonbury, Ct. Farmer.
 Mudge, Everett P., K Σ , 69 Cherry St., Swampscott, Mass. Tree Warden.
 Peakes, Ralph W., Q.T.V., 7 Walnut St., Newtonville, Mass. Chemist with Cochran Chemical Co., Everett, Mass.
 Pray, F. Cville, Φ Σ K, Trinidad, Cuba. Summer address, No. Amherst, Mass. Chemist and Superintendent, Trinidad Sugar Co.
 Rogers, Stanley S., Φ K Φ , K Σ , Davis, Cal. Assistant Professor, Olericulture, University of California.
 *Russell, Harry M., Φ K Φ , C.S.C. Died about July 1, 1915.
 Scott, Edwin H., Φ K Φ , K Σ , Milledgeville, Ga. Registrar and Head of Department of Agriculture, Georgia Normal and Industrial College. M.Sc., Dartmouth, 1913.
 Sleeper, George W., Φ K Φ , A Σ Φ , 27 Rockland St., Swampscott, Mass. Business address, 99 South St., Boston, Mass. Leather business.
 Strain, Benjamin, Q.T.V., c/o William Strain, Mt. Carmel, Ct.
 *Suhlike, Herman A., K Σ . Died November 15, 1914, at Harper Hospital, Detroit, Mich.
 Taft, William O., A Σ Φ , Sterling, Mass. Farmer.
 Tannatt, Willard C., Jr., Φ K Φ , C.S.C., 3 Center St., Easthampton, Mass. Town Engineer.
 Tirrell, Charles A., Q.T.V., 1481 Irving Park Blvd. Business address, 815 Steinway Hall, Chicago, Ill. Landscape Engineer.
 Wellington, Richard, Φ K Φ , Q.T.V., 2214 Scudder St., St. Paul, Minn. Horticulturist. M.Sc., Harvard, 1911.
 *Wholley, Francis D., Q.T.V. Died January 23, 1914.
 Wood, Alexander H. M., K Σ , Eastondale, Mass. Farmer.

NON-GRADUATES

Abbott, Chester D., Andover, Mass. Milk Dealer.
 Bacon, Roland A., 144 N St. Business address, 423 Broadway, South Boston, Mass. Window Trimmer.
 Baird, Clarence H., Morden, Manitoba, Canada. Stock Raiser.
 Brydon, Robert P., Mayfield Rd., Cleveland Heights, Ohio. Gardener.
 Colton, William W., Φ Σ K, 843 Watertown St., West Newton, Mass. Forest Commissioner, City of Newton. B.S., Harvard, 1907.
 Connely, Thomas H., Brighton, Mass. Judge of Municipal Court.
 Cowles, Edward R., Q.T.V., Deerfield, Mass. Farmer.
 Farrar, Allen D., Q.T.V., 35 Montrose St., Springfield, Mass. Manager, Coöperative Lyceum Bureau.
 Ferren, Frank A., Q.T.V., 154 Warren Ave., Boston, Mass.
 Foster, Samuel C., 100 Chestnut St., Boston, Mass.
 Goodale, Ray C., K Σ , Suffield, Ct. Farmer.
 Hayward, Afton S., 1617 Julia St., South Berkeley, Cal.
 Hersen, Elbert W., Waukegan, Ill. (1911).
 Jones, Louis F., Φ Σ K, Strong, Maine.
 *Keith, Earl W. Died in July, 1906, at North Easton, Mass.
 Mahoney, Francis W., Dorchester, Mass.
 Markham, Joseph M., Ayer, Mass.

Morse, Stanley F., Q.T.V., 127 E. 3d St., Tucson, Ariz. Superintendent Agricultural Extension Service, University of Arizona. State Leader, U.S.D.A.
 Prenn, Joseph. Address unknown.
 Racicot, Lieut. Arthur A., Jr., C.S.C., 1st Lieutenant, U. S. Marine Corps, U. S. Legation, Peking, China.
 Russell, Herbert O., North Hadley, Mass. Farmer.
 *Shannon, Alonzo H. Deceased.
 Spurr, Fred Y., Q.T.V. Address unknown.
 Stevens, Fred O., Weymouth, Mass. Superintendent, Water Works. Graduated from University of Maine, 1906.
 Stoddard, Calder S., K Σ. Address unknown.
 Sullivan, Patrick F. Address unknown.
 Webb, Paul, 42 Church St., New Haven, Ct. Lawyer, LL.B., Yale, 1915.
 White, Vernon O., Q.T.V., 43 Dean St., Attleboro, Mass. Jeweler.

1907

CLINTON KING, *Secretary.*

*Armstrong, Arthur H., K Σ. Died December 22, 1908.
 Bartlett, Earle G., Φ K Φ, Φ Σ K, Kamehameha Schools, Honolulu, T. H. Instructor in Mathematics.
 Caruthers, J. Thomas, 1624 Jackson St., Nashville, Tenn. Department of Agronomy and Biology, Fisk University.
 Chace, Wayland F., C.S.C., St. John, Ore.
 Chapman, George H., A Σ Φ, 13 Fearing St., Amherst, Mass. Plant Physiologist, Massachusetts Agricultural Experiment Station. M.Sc., Massachusetts Agricultural College, 1909.
 Chapman, Joseph O., K Σ, 18 Stevens St., No. Andover, Mass. Farmer.
 Clark, Milford H., Jr., C.S.C., 227 Oxford Ave. Business address, 13 City Hall, Buffalo, N. Y. Assistant City Forester.
 Cutter, Frederick A., Φ Σ K, 40 Elm St., Orange, N. J.; Box 999. Forester.
 Dickinson, Walter E., Φ K Φ, Φ Σ K, Banco Nacional 502, Havana, Cuba. Agriculturist and Sugar Technologist.
 Eastman, Jasper F., Φ K Φ, Broome County Farm Agent, c/o Chamber of Commerce, Press Bldg., Binghamton, N. Y. M.Sc., University of Illinois, 1910.
 Hartford, Archie A., Westford, Mass. Business address, Lewiston, Me. Teacher.
 Higgins, Arthur W., Φ K Φ, K Σ, Westfield, Mass. Florist and Farmer.
 King, Clinton, Φ K Φ, Q.T.V., 619 White St. Business address, 31 Elm St., Springfield, Mass. Lawyer. LL.B., Boston University, 1910.
 Livers, Miss Susie D., State School for Girls, Lancaster, Mass.
 Parker, Charles M., Φ K Φ, Q.T.V., Brookfield, Mass. Farmer.
 Peters, Frederick C., Φ Σ K, P. O. Box 546, Ardmore, Pa. Landscape Forester and Entomologist.
 Shaw, Edward H., Φ Σ K, 215 Washington St., Belmont, Mass. Market Gardener.
 Summers, Dr. John N., A Σ Φ, 17 E. Highland Ave., Melrose Highlands, Mass. Scientific Assistant, Bureau of Entomology, U. S. Department of Agriculture. Ph.D., Massachusetts Agricultural College, 1911.
 Thompson, Clifford B., Φ Σ K, Philippine Islands.
 Walker, James H., Φ Σ K, City Hall, Newark, N. J. City Forester.
 Watkins, Fred A., Φ Σ K, Millbury, Mass. Market Gardener.
 Watts, Ralph J., Φ K Φ, Φ Σ K, Amherst, Mass. Secretary, Massachusetts Agricultural College.
 Wood, Herbert P., A Σ Φ, 4400 Bryan St., Dallas, Texas. Bureau of Entomology, U. S. Department of Agriculture.

NON-GRADUATES

Amsden, Eugene C. Address unknown.
 Arimoto, Shintaro, Furumachi, Mimasaka, Japan. Agriculturist.
 Chadwick, Clifton H., Φ Σ K, 5476 Everett Ave. Business address, 604 First National Bank Bldg., Chicago, Ill. Estimator.

*Chapman, William S., Q.T.V. Died December 31, 1904, at Attleboro, Mass.
 Clementson, Lewis T., 27 Hitchcock Rd., Worcester, Mass. Deputy Sealer, Weights and Measures.
 Curtis, Jesse G., $\Phi \Sigma K$, 322 Murtland Ave., Pittsburgh, Pa. Business address, 2401 Farmers' Bank Bldg., Pittsburgh, Pa. Forester.
 Curtis, Walter L., Q.T.V., 1264 West Second St., Los Angeles, Cal.
 Dearth, George A., $K \Sigma$, 23 Kendall Ave. Business address, 137 Waverly St., Framingham, Mass. Real Estate.
 Denham, Edwin T., C.S.C., Tewksbury, Mass. Superintendent, Carnation Growing Plant.
 Dudley, Fred S. Address unknown.
 Engstrom, Niles, $K \Sigma$, 10 Euclid Ave., Worcester, Mass.
 Finkelstein, David E. Address unknown.
 French, Vida R. Address unknown.
 Gould, Harry W., Millbury, Mass. Construction Reporter.
 Green, Herbert H., $\Phi \Sigma K$, 253 Main St., Spencer, Mass. Florist. B.Sc., University of Maine, 1907.
 Hall, Walton, Jr., $\Phi \Sigma K$, Moodus, Ct. Cotton Mill Superintendent.
 Hanson, Stuart W., $\Phi \Sigma K$. Address unknown.
 Jones, Arthur M., Ludlow, Mass. Farmer.
 Kalina, Jacob. Address unknown.
 Knox, Harry C., 20 West St., Westboro, Mass. Foreman, Graton & Knight Manufacturing Co., Worcester, Mass.
 Lanigan, William J., 41 Belmont St., Rockland, Mass.
 Leighton, Carl, C.S.C. Address unknown.
 Leominster, William, Acushnet Station, New Bedford, Mass. Farmer.
 Lincoln, Ernest A., C.S.C., 457 June St. Business address, 29 Bedford St., Fall River, Mass.
 Marran, Bernard J., Great Barrington, Mass. Electrical Tester.
 *Perkins, Edward C., $K \Sigma$. Died June 20, 1904, at Springfield, Mass.
 Pierce, Henry T., C.S.C., West Millbury, Mass. Business address, 801 Bradley Bldg., Worcester, Mass. Civil Engineer. C.E., 1908.
 Pray, Rutledge P., 6th Ave. and 18th St., New York City.
 Raitt, John A., $\Phi \Sigma K$. Address unknown.
 Rice, Charles A. A., $\Phi \Sigma K$, 189 Oak Grove Ave. Business address, 331 Dwight St., Springfield, Mass. Manager, Firm of D. E. Rice.
 Searle, George W., $\Phi \Sigma K$, 6 Mill St., Westfield, Mass. Town Clerk, Treasurer and Collector.
 Shaw, Chester L., 88 Pearl St., Middleboro, Mass. Bookkeeper.
 Shaw, Frank E., $\Phi \Sigma K$, 626 Crescent St. Business address, 43 No. Montello St., Brockton, Mass. Foreman.
 Shuttleworth, Edwin L., Champlain Mills, Winooski, Vt.
 Smith, George F., $K \Sigma$, Barre, Mass. Farmer.
 Whitney, John F., Q.T.V., Woodsville, N. H. Civil Engineer, B. & M. R. R.

1908

S. J. WRIGHT, *Secretary*.

Allen, Charles F., C.S.C., Box 459, Columbus, Neb. Salesman, Simmons Hardware Co.
 Alley, Harold E., $K \Sigma$, Camp 100, Atascadero, Cal. Horticulturist.
 Anderson, John A., $\Phi \Sigma K$, 7 Seymour St., Montclair, N. J. Forester and Secretary, Shade Tree Commission.
 *Anderson, Kenneth F. Died May, 1911, in the Philippine Islands.
 Bailey, Ernest W., $\Phi K \Phi$, $K \Sigma$, 605 Michigan Ave., Urbana, Ill. Assistant Professor of Pomology and Assistant Chief in Plant Breeding, University of Illinois. M.Sc., University of Illinois, 1909.
 Bangs, Bradley W., A $\Sigma \Phi$, Carteret, N. J. Chemical Engineer.
 Barry, Thomas A., $\Phi K \Phi$, C.S.C., 162 Lowell Ave., Newtonville, Mass.
 Bartholomew, Miss Persis, Milk St., Westboro, Mass. Agriculturist. Director of seed distribution work of Boston. Supervisor, School Gardens.

- Bates, Carleton, K Σ, Superintendent, Gelatine Manufacturing Plant, U. S. Glue Co., Milwaukee, Wis.
- Chapman, Lloyd W., Q.T.V., Penn's Grove, N. J. Manufacturing Chemist.
- Chase, Henry C., C.S.C., Swampscott, Mass. Business address, 75 South St., Boston, Mass. Salesman.
- Clark, Orton L., Φ Σ K, Amherst, Mass. Assistant Botanist, Massachusetts Agricultural Experiment Station.
- Cobb, George R., C.S.C., Box 174, Kingston, R. I. Professor of Horticulture, R. I. College of Agriculture and Mechanic Arts.
- Coleman, William J., C.S.C., 1182 Broad St., Newark, N. J. Shade Tree Commission.
- Cummings, Winthrop A., Q.T.V., 206 Pine Lake Ave., LaPorte, Ind. Superintendent, Fox Park.
- Cutting, Roy E., Φ Σ K, 127 Quincy Ave., Winthrop, Mass. Business address, Room 727, 50 Congress St., Boston, Mass. With Quaker Oats Co.
- Daniel, John, Φ K Φ, Q.T.V., Marstons Mills, Mass. Farmer.
- Davenport, S. Lothrop, Φ Σ Φ, K Σ, 7 Chase St., Danvers, Mass. Fruit Grower. Instructor.
- Davis, Paul A., Φ K Φ, Θ X, R. R. No. 2, Newton, N. H. Poultryman.
- Dolan, Clifford, Bullard Colonial Farm, Holliston, Mass. Foreman.
- Eastman, Perley M., 7 Barclay St., Summit Park, Albany, N. Y. Inspector of Nurseries, New York State Department of Agriculture.
- Edwards, Frank L., Φ Σ K, Petersham, Mass. Agricultural Instructor, Petersham High School.
- Farley, Arthur J., Q.T.V., 275 George St., New Brunswick, N. J. Assistant Horticulturist, N. J. Agricultural Experiment Station. Instructor in Horticulture, Rutgers College.
- Farrar, Parke W., K Σ, 83 Harvard St., Springfield, Mass. Business address, Fisk Rubber Co., Chicopee Falls, Mass.
- Flint, Clifton L., K Σ, 1233 Olive St., Fresno, Cal.
- Gillett, Chester S., Φ K Φ, K Σ, Southwick, Mass.
- Gillett, Kenneth E., Φ K Φ, Φ Σ K, Southwick, Mass. Nurseryman.
- Gowdey, Carlton C., Φ K Φ, C.S.C., Kampala, Uganda, British East Africa. Government Entomologist.
- Hayes, Herbert K., Φ K Φ, K Σ, 1460 Hythe St., St. Anthony Park, St. Paul, Minn. Associate Professor of Plant Breeding, University of Minnesota. Associate Agronomist, Experiment Station. M.S., Harvard, 1911.
- Howe, William L., Union St., Marlboro, Mass. Farmer.
- Hutchings, Frank F., Q.T.V., Springfield, Mass.
- Hyslop, James A., Q.T.V., Dewey Ave., Hagerstown, Md. Bureau of Entomology, U. S. Department of Agriculture. M.Sc., Washington State College, 1911.
- Jackson, Raymond H., Φ Σ K, Amherst, Mass. Merchant.
- Jennison, Harry M., C.S.C., c/o Botanical Gardens, St. Louis, Mo. Instructor in Botany, Washington University, and Graduate Student at Missouri Botanical Gardens. M.A., 1911.
- Johnston, Fred A., C.S.C., Washington, D. C., Bureau of Entomology, U. S. Department of Agriculture.
- Jones, Thomas H., Φ K Φ, Q.T.V., State Experiment Station, Baton Rouge, La. Entomologist, U. S. Bureau of Entomology.
- Larned, Adelbert J., Q.T.V., Amherst, Mass. Farmer.
- Larsen, L. David, Φ K Φ, K Σ, Kalakana Ave., Honolulu, T. H. Plant Pathologist.
- Liang, Lai Kuei, Vice-Minister of Agriculture, Peking, China.
- Miller, Danforth P., K Σ, 3 Midland St. Business address, 9 Pleasant St., Worcester, Mass. Manager, Sumner Fruit Co.
- Paige, George R., Q.T.V., Sanborn Map Co., 11 Broadway, N. Y.
- Parker, John R., K Σ, 518 West Koch St., Bozeman, Mont. Assistant Entomologist, Montana Agricultural Experiment Station.
- Philbrick, Edwin D., Φ Σ K, Virginia, Minn. Superintendent of Parks.
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- Sawyer, William F., Q.T.V., Sterling Junction, Mass. Business address, Room 35, 25 Foster St., Worcester, Mass. Architectural Draughtsman.
- Shattuck, Leroy A., C.S.C., Pepperell, Mass. Farmer.
- Thurston, Frank E., $\Phi \Sigma K$, Trinidad, Cuba. Superintendent for Trinidad Sugar Co.
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- Turner, W. F., $\Phi K \Phi$, Q.T.V., Vienna, Va. Entomological Assistant, U. S. Department of Agriculture, Bureau of Entomology.
- Verbeck, Roland H., $\Phi \Sigma K$, Kezar Falls, Me. Principal, Parsonsfield Seminary.
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- Wellington, Joseph W., Q.T.V., Geneva, N. Y. In New York Agricultural Experiment Station.
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- Whitmarsh, Raymond D., $K \Sigma$, Wooster, Ohio. Assistant Entomologist, Ohio Agricultural Experiment Station. M.Sc., Massachusetts Agricultural College, 1911.
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- *Bennett, Ernest V. Deceased.
- Blake, Rodman R., C.S.C., East Pepperell, Mass. Machinist.
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- Edmands, Ernest C., North Reading, Mass.
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- *Goodwin, Chester L. Died in 1906.
- Hamburger, Amos F., C.S.C., Suncook, N. H. Farmer.
- Lacouture, George L., Millbury, Mass. Grocer.
- Negus, Philip H. Address unknown.
- Pagliery, Jose Cicilio, $\Phi \Sigma K$. Address unknown.
- Potter, John S., Q.T.V., San Anselmo, Cal. Theological Student, San Francisco Theological Seminary.
- Wheeldon, Albert J. Address unknown.

1909

ORWELL B. BRIGGS, *Secretary*.

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Barnes, Benjamin F., Jr., Θ X, Upland Farms, Ipswich, Mass. Farm Manager.

Bartlett, Dr. Oscar C., A Σ Φ, 642 N. 5th Ave. Business address, Box 348, Phoenix, Ariz., or 547 West Adams St., Phoenix, Ariz. Assistant State Entomologist. Ph.D., Massachusetts Agricultural College, 1912.

Briggs, Orwell B., Q.T.V., Woodlawn Station. Business address, 1011 Fidelity Bldg., Baltimore, Md. Local Manager, Bowker Insecticide Co; President, Fenton Brook Farm Co., at Great Barrington, Mass.

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Ingalls, Dorsey F., Q.T.V., Berkshire, Mass. Farmer.

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Lindblad, Rockwood C., Φ K Φ, K Σ, 324 Warren St., Hudson, N. Y., P. O. Box 42. Signal Inspector, N. Y. Central Railroad.

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Potter, Richard C., Q.T.V., Berwyn, Ill.

Putnam, Charles S., Φ K Φ, Θ X, Lahainaluna Schools, Lahaina, Maui, T. H. Teacher.

Sexton, George F. Address unknown.

Shamiae, G. M. Address unknown.

Smulyan, Dr. Marcus T., Blacksburg, Va. Assistant Entomologist, Experiment Station. Ph.D., M. A. C., 1914.

Thompson, Myron W., Φ Σ K, 1040 Josephine St., Denver, Col. Forest Examiner in U. S. Forest Service. M.F., Yale, 1911.

Thomson, Jared B., C.S.C., Monterey, Mass. Farm Manager.

Turner, Henry W., C.S.C., c/o Consuelo Sugar Co., San Pedro de Mocris, Dominican Republic.

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 Gates, Clarence A., Westboro, Mass.
 Handy, Leroy M., 8 Kimball St., Worcester, Mass. Teacher in High School of Commerce. A.B., Clark University, 1908.
 *Hibbard, Myron J. Deceased.
 Hillman, Arthur J., Barre, Mass.
 *Kenney, Walter J. Died while in College.
 Lambert, Miss Majorie W., Milledgeville, Ga. Instructor in Biology and Poultry Husbandry.
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 Pearce, Ernest E. Address unknown.
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1910

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Mendum, Samuel W., Φ K Φ , Θ X, 22 Woodville St., Roxbury, Mass. Farm Accountant. M.S., University of Wisconsin, 1913.

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Partridge, Frank H., Φ Σ K, Haiku, Maui, Hawaii. Pineapple Plantation Manager.

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Vinton, George N., Box 43, Sturbridge, Mass. Farmer.
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 Wallace, Wm. N., R. R. No. 2, Ludlow, Mass. Farmer.

NON-GRADUATES

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 University of Chicago.
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 *Chase, George B. Deceased.
 Curtiss, William E., K Σ , c/o Berkshire Hills School, Great Barrington, Mass.
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 Drohan, Joseph C., 43 East School St., South Hadley Falls, Mass.
 Eldridge, Cecil V., Q.T.V., 85 Water St., Boston, Mass.
 Faelten, Willibald C., Holliston, Mass. Farmer.
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 Kelly, Edward N., c/o Lyman School, Westboro, Mass.
 Leonard, Leavitt E., Pittsford, Vt. Farmer.
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 McFarlane, George E. Address unknown.
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 Orr, Lewis J., Φ Σ K, R. R. No. 1, Clinton, Wash.
 Orr, Philip E., R. R. No. 1, Clinton, Wash.
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 Roy, Miss G. Calista. Teacher, Public Schools, Springfield, Mass. (1914.)
 Smith, Halliday S. Address unknown.
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 Stockwell, Chellis W., Φ Σ K, Melrose Highlands, Mass. Entomologist.
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 Taylor, Israel H., Leverett, Mass. Teacher.
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1911

L. M. JOHNSON, *Secretary*.

Adams, James F., Q.T.V., University Club, State College, Pa. Assistant Professor
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 lege, 1914.
 Allen, Park W., Φ Σ K, 69 Franklin St., Westfield, Mass. Insurance, Real Estate
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 Baker, Herbert J., K Σ , Connecticut Agricultural College, Storrs, Ct. Director,
 Extension Service.
 Barrows, Raymond C., Q.T.V., Stafford Springs, Ct. Farmer and Lumberman.

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Ostrolenk, Bernhard, Canby, Minn. Teacher in Canby State High School.

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 Hazen, Jacob. Address unknown.
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 Howard, Frederick W., Glastonbury, Ct. Farmer.
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 Huang, Chen-Hua. Home address, Tientsin, China.
 Hyatt, Herbert F. Address unknown.
 Lew, Gerard N. Address unknown.
 Liang, Ying Chi. Address unknown.
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 McGann, P. S. Address unknown.
 McNayr, Rupert S., $\Phi \Sigma K$, Winston Salem, N. C. (1912).
 Merrill, Charles E., 90 Curtis St., W. Somerville, Mass. Caretaker.
 Merrill, George B., Estacion Experimental, Rio Piedras, P. R. Entomologist.
 Moody, Chester, Q.T.V. Address unknown.
 O'Connor, J. H. Address unknown.
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 Spencer, Howard, Belchertown, Mass. Farmer.
 Tilton, George A., Box 13, Wells Depot, Me. Farmer.
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 Williams, Geo. E., Pennington, N. J.
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1912

F. S. MADISON, *Secretary*.

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1913

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†Caldwell, D. L.....	14	†Chaplin, J. D. H....	83	Clarke, W. R.....	10
†Caldwell, J. S.....	08	*†Chapman, E. B....	72	*†Clay, C. M.....	82
†Caldwell, L. S.....	12	Chapman, G. H.....	07	Clay, H. J.....	14
Caldwell, W. H.....	87	†Chapman, J. C.....	99	*Clay, J. W.....	75
Cale, G. H.....	15	Chapman, J. O.....	07	Clegg, F. J.....	14
†Call, A. E.....	10	Chapman, L. W.....	08	†Cleland, W. F.....	73
†Callard, J. C.....	15	*†Chapman, W. S....	07	†Clemenstson, L. T..	07
Callender, T. R.....	75	*†Chapon, R. H.....	14	Cleland, W. A.....	15
Calvert, M. B.....	14	†Charmbury, T. H....	97	Cloues, W. A.....	10
†Camargo, H. P.....	79	Chase, A. B.....	15	Clough, M. J.....	15
†Campbell, C. H.....	79	Chase, E. L.....	09	†Coash, W. H.....	11
†Campbell, C. A.....	12	†Chase, E. T.....	75	Cobb, G. R.....	08
Campbell, F. G.....	75	*†Chase, G. B.....	10	Cobb, J. B.....	13
Campbell, D. M.....	14	†Chase, H. K.....	82	*Coburn, C. F.....	78
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Cande, D. H.....	15	Chase, W. E.....	87	†Cochran, R. A.....	82
Canto, Y. H.....	00	†Chase, W. J.....	02	Codding, G. M.....	09
†Capen, T. A.....	73	†Cheever, H. M.....	03	†Codina, G.....	72
Cardin, P. P.....	09	*Cheney, L. L.....	97	*†Codman, F.....	80
†Cardoso, R.....	85	Chickering, D. O....	76	†Cohen, H.....	12
†Carey, C. B.....	79	Chickering, J. H....	01	†Cohen, S. A.....	15
Carey, D. H.....	06	†Childs, W. F.....	73	†Colby, D. T.....	73
*†Carmody, J. F.....	03	†Chipman, F. E.....	82	†Colby, F. W.....	97
*†Carneiro, M. D.....	78	†Chittenden, E. W....	79	†Colcord, W. R.....	89
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Carpenter, D. F.....	86	Christie, E. W.....	14	†Cole, D. P.....	71
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Carpenter, M. A.....	91	†Churchill, C. A.....	15	†Cole, H. E.....	14
Carpenter, T. M.....	02	Churchill, G. C.....	14	Cole, W. R.....	02
*Carr, W. F.....	81	Clafin, L. C.....	02	Coleman, D. A.....	14
Carruth, H. S.....	75	†Clancy, E. F.....	12	Coleman, I.....	13
†Carter, C. M.....	05	Clapp, C. W.....	86	†Coleman, L. N.....	09
†Carter, H. R.....	08	Clapp, F. L.....	96	†Coleman, R. P.....	97
*†Carter, H. M.....	73	Clapp, R. K.....	12	Coleman, W. J.....	08
†Carter, S. M.....	75	†Clare, F. H.....	15	†Coles, C. E.....	11
*†Carter, W. E.....	76	†Clark, A. L.....	15	†Collins, J. D.....	04
Caruthers, J. T.....	07	†Clark, A.....	77	†Collum, G. N.....	78
*†Carvalho, W.....	78	Clark, C. G.....	98	†Colton, W. W.....	06
Carver, J. S.....	13	†Clark, C. T.....	76	†Comins, W. H.....	82
†Cary, W. E.....	10	†Clark, E. H.....	95	Conant, A. T.....	11
*†Cary, W. H.....	71	Clark, E. T.....	92	†Condit, C. de H....	92
†Cary, W. W.....	80	Clark, E. F.....	15	†Conger, C. T.....	83
*†Casey, M. F.....	71	Clark, E. S.....	14	†Connely, T. H.....	06
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†Casparian, G.....	82	Clark, H. E.....	95	†Cook, J. E.....	94
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Chace, W. F.....	07	Clark, L. F.....	97	†Cook, R. C.....	79
†Chadbourne, A. H....	85	Clark, M. H.....	07	†Cook, R. L.....	76
†Chadbourne, J. G....	11	Clark, N. R.....	13	†Cook, W. A.....	09
†Chadwick, C. H.....	07	Clark, O. L.....	08	†Cooke, C. M.....	73
†Chaffee, A. B.....	10	†Clark, S. D.....	15	Cooke, T. F.....	01
†Chamberlain, P. A....	92	*†Clark, W. V.....	81	Cooley, F. S.....	88
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Chandler, E. S.....	82	*†Clark, W. A.....	74	Cooley, R. A.....	95
*†Chandler, W. M....	82	†Clark, W. J.....	73	*†Cooley, S. R.....	78
†Chapin, C. G.....	87	*Clark, X. Y.....	75	Cooper, E. H.....	13
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†Chapin, W. L.....	02	*†Clarke, G. C.....	01	†Copeland, A. B.....	86

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†Cox, A. E.....	09
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†Cronyn, T. R.....	09
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†Crowell, C. A.....	00
†Crowell, W. R.....	00
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†Cummings, J. F.....	04
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†Curtis, J. G.....	07
†Curtis, W. L.....	07
*Curtis, W. F.....	74
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†Cushman, R. H.....	87
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†Damon, S. R.....	14
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*Dana, G. H.....	01
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*†Davis, G. B.....	78
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†Davis, J. A.....	99
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*†Dickinson, H. W.....	84
†Dickinson, J. F.....	85
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*†Dole, E. J.....	88
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†Donnell, G. E.....	15
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†Dorman, A. R.....	01
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†Drury, R. W.....	95
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†Dudley, F. S.....	07
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*†Dutton, C. K.....	82
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Dwyer, C. E.....	02
†Dwyer, E. F.....	95
*Dyer, E. N.....	72

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†Goodale, R. C.....	06	*Hague, H.....	75	Hastings, A. T.....	06
†Goodell, J. S.....	94	†Haley, G. W.....	92	†Hastings, D. B.....	10
†Goodenough, H. H...	05	†Hall, A. O.....	81	†Hatch, G. S.....	75
†Goodnough, H. E....	13	†Hall, A. S.....	80	Hatch, H. T.....	13
Goodrich, C. A.....	93	Hall, A. W.....	06	Hatch, W. B.....	05
†Goodrich, W. F.....	77	*†Hall, F. A.....	71	†Hatch, W. M.....	10
*†Goodwin, C. L.....	08	Hall, G. M.....	15	Hatfield, W. H.....	15
Goodwin, M. N.....	15	Hall, H. B.....	12	†Hathaway, B. O....	87
Gordon, C. E.....	01	Hall, H. W.....	12	Hathaway, E. F.....	09
Gore, H. M.....	13	Hall, J. C.....	02	†Hathaway, I.....	15
†Gorham, F. S.....	92	Hall, J. N.....	78	†Haug, C. A.....	15
†Goss, F. W.....	78	*†Hall, L. W.....	71	†Hawes, C. P.....	15
†Gould, H. W.....	07	†Hall, R. S.....	12	Hawks, E. A.....	93
†Gould, H. A.....	10	Hall, R. C.....	15	†Hawley, A. S.....	81
Gowdey, C. C.....	08	†Hall, W.....	07	*Hawley, F. W.....	71
†Gowdy, H. M.....	82	†Hallet, C. W.....	90	Hawley, J. M.....	76
Graham, C. S.....	92	Halligan, C. P.....	03	†Hayden, W. V.....	13
†Graham, L. H.....	15	Halligan, J. E.....	00	Hayes, H. K.....	08
Grant, H. D.....	15	Hallowell, R. N....	12	Haynes, F. T.....	10
†Graves, B. R.....	14	*†Hamblin, J. H....	05	†Hayward, A. S.....	06
†Graves, E. L.....	05	Hamblin, S. F.....	12	Hayward, A. I.....	88
†Graves, G. A.....	04	†Hamburger, A. F...	08	†Hayward, R. L.....	96
†Graves, G. G.....	71	†Hamilton, P.....	12	Hayward, W. W.....	10
†Graves, L. B.....	75	Hammar, J. F.....	96	Hazen, E. L.....	14
Graves, T.....	01	†Hammond, A. A....	12	†Hazen, J.....	11
Gray, F. L.....	12	†Hammond, C. P....	11	Hazen, M. S.....	10
†Grebin, M. A.....	14	†Handy, L. M.....	09	Headle, H. W.....	13
†Greeley, D. S. B....	01	Handy, R. E.....	14	Headle, M.....	13
*†Green, C. D.....	93	†Handy, R. S.....	04	Heald, J. M.....	12
†Green, H. H.....	07	†Hanlon, H. C.....	02	†Healey, G. C.....	73
†Green, J. E.....	96	†Hanson, S. W.....	07	†Heartz, F. O.....	15
*Green, S. B.....	79	*†Hardy, E. E.....	74	†Heath, C. B.....	13
†Greene, F. B.....	76	Harlow, F. T.....	93	Heath, H. G. K....	78
Greene, F. L.....	94	Harlow, H. J.....	93	†Heatley, D. B.....	12
Greene, I. C.....	94	Harlow, J. A.....	12	Hebard, E. B.....	14
†Greene, W. H.....	71	*Harmon, A. A.....	00	Heffron, F.....	14
Greenleaf, G. F.....	13	Harper, J. E.....	15	†Heighway, S. C....	80
†Greenman, F. H....	02	†Harper, R. W.....	15	†Helberg, H. W....	13
Gregg, J. W.....	04	Harper, W. B.....	96	†Hemenway, F. E...	01
Gregory, E.....	90	†Harriman, V. S....	14	Hemenway, H. D....	95
†Gregory, J. H.....	93	†Harrington, F. W...	72	Hemenway, T.....	12
†Grey, G. H.....	11	†Harrington, H. L...	11	†Henderson, E. H...	95
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†Griffin, W. G.....	14	Harris, B. A.....	13	†Hennessey, W. F...	11
Griggs, F. D.....	13	†Harris, F. A.....	03	Henry, J. B.....	01
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†Groeger, G.....	88	†Harris, R. B.....	82	Henshaw, F. F.....	04
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†Guild, L. F.....	13	Hartwell, B. L.....	89	*Herrick, F. S. C...	71
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*†Gunn, W. B.....	77	Harvey, R. W.....	15	†Heyl, J. E.....	74
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*†Hill, L. W. B.....	04	†Howlett, L. C.....	13	Jenks, A. R.....	11
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†Hillman, A. J.....	09	†Hoyt, F. S.....	14	†Jenney, H. H.....	14
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*†Hinsdale, R. C.....	88	*†Hubbard, F. H.....	71	†Johnson, B. P.....	15
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†Hoar, T.....	92	†Hubbard, G. A.....	95	Johnson, C. H.....	91
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†Hobbs, J. O.....	76	†Hubbard, R. E.....	13	†Johnson, I. H.....	88
*†Hobbs, J. F.....	81	Hubert, B. F.....	12	Johnson, L. M.....	11
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†Hogan, F. W.....	90	Hull, E. T.....	00	Johnson, W. C.....	10
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Holman, S. M.....	83	†Huntington, R. E.....	05	Jones, E. A.....	84
†Holmes, H. H.....	75	Huntington, S. P.....	13	Jones, F. W.....	82
*Holmes, L. LeB.....	72	†Hurley, C. A.....	13	Jones, G. D.....	03
†Holmes, S. J.....	82	*†Hurley, M. E.....	91	Jones, H. F.....	13
*†Holt, H. D.....	98	†Huse, F. R.....	89	†Jones, J. H.....	95
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*Hood, C. E.....	06	Hutchings, H. C.....	13	†Jones, N. N.....	82
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San Gabriel
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*Nourse, S. J.	1887
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*Lambert, Miss M. W.	1909
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*Abercrombie, F. N.	1882
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Brooks, P. C.	1901
*Cary, W. E.	1910
*Chadwick, C. H.	1907
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 Whiteman, N. D. 1901
 Wilder, J. E. 1882

Evanston

*Childs, W. F. 1873
 *Howe, E. L. 1892

Jacksonville

*Alexander, E. P. 1874

Manteno

Smith, L. W. 1893
 *Wright, E. M. 1899

Urbana

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*Hersen, E. W. 1906

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Indianapolis

*Austin, F. L. 1908
 *Barclay, F. W. 1897
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*Eastman, G. H. 1871

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*Cochran, R. A. 1882

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*Wells, N. H. 1914

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*Stalker, W. A. 1910

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 *Bement, J. E. 1886
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*Harper, R. W.	1915
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*Peabody, C. H.	1875
Perry, J. R.	1893
Pickard, P. W.	1911
*Ranlett, C. A.	1897
*Richardson, B. P.	1880
*Rose, S. D.	1913
Rudolph, G.	1879
Seller, R. P.	1889
Shultis, N.	1896
*Simmons, G. W.	1914
Sleeper, G. W.	1906
Smith, L. E.	1914
*Springer, I.	1912
*Taylor, H. M.	1878
*Tucker, F. H.	1876
*Walsh, T. F.	1905
Wheeler, H. J.	1883
Wheeler, W.	1871
*Wheeler, W. G.	1914
*White, H. D.	1915
White, H. L.	1909
*White, S. A.	1914
*Whitman, W. C.	1913
*Wood, A. P.	1911
Bourne	
*Ellis, E. S.	1876
Boxboro	
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*Vance, P. G.	1903
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*Hubbard, G. A.	1895
Bridgewater	
*Brown, E. H.	1909
*Cox, A. E., Jr.	1909
*Cutler, G. W.	1888
Warren, F. L.	1895
Brighton	
*Connely, T. H.	1906
*Patten, M. C.	1915
Brimfield	
Abbott, L. E.	1914
*Howlett, L. C.	1913
Streeter, C. M.	1913
Tarbell, M. G.	1914

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*Baldus, F. G.	1892
*Churchill, C. A.	1915
Hickey, F. B.	1912
*Hurley, C. A.	1913
*Kelleher, J.	1904
Kennedy, F. H.	1906
*Kinney, W. C.	1913
Lincoln, M. D.	1914
*Peabody, H. E.	1902
*Shaw, F. E.	1907
Tupper, B.	1905
Whitney, R. L.	1911
Brookfield	
*Clark, E. H.	1895
Parker, C. M.	1907
Brookline	
Baker, H. M.	1912
*Dickinson, J. F.	1885
*Hayden, W. V.	1913
Burlington	
*Donnell, G. E.	1915
Cambridge	
Barry, J. M.	1897
Blair, J. R.	1889
Brooks, S. C.	1910
Curtis, A. C.	1894
*Daniels, L. E.	1911
*Day, G.	1896
Hathaway, E. F.	1909
Lincoln, I. B.	1915
Miles, A. L.	1889
Mueller, A. F.	1912
North, M. N.	1889
Sears, W. R.	1915
Torrey, R. E.	1912
Zehrun, S. D.	1915
Campello	
Frost, R. T.	1915
Hasey, W. H.	1913
*Moberg, C. D.	1915
Canton	
*Boutelle, A. A.	1899
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*Handy, R. S.	1904
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Osterhout, J. C.	1887
*Park, F. W.	1894
Chelsea	
*Grey, G. H.	1911
*Hall, A. O.	1881
*Kopowitz, S.	1915
*Norton, C. H.	1915
Chester	
Alderman, E. H.	1894
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*Blackhall, A. J.	1914
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*Chapin, C. G.	1887
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*Lyman, A. W.	1875
Chicopee Falls	
*Bartlett, L. W.	1908
Cobb, J. B.	1913
*Goodenough, H. E.	1913
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Lucas, H. D.	1914
Roehrs, H. T.	1913
Williams, S.	1912
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Curran, D. J.	1912
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*Anderson, L. O.....	1914
*Barker, C. A., Jr.....	1872
Heald, J. M.....	1912
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Leland, W. S.....	1873
*Whitcomb, N. H.....	1890
Cummington	
*Streeter, A. R.....	1894
Dalton	
*Bardin, J. E.....	1892
*Sullivan, A. J.....	1914
Danvers	
*Damon, H. F.....	1908
Davenport, S. L.....	1908
Davies, L. G.....	1914
Gifford, J. E.....	1894
*Graves, B. R.....	1914
Marsh, J.....	1895
Dartmouth	
*Sherman, H. R.....	1897
Dedham	
Munson, W. A.....	1905
Deerfield	
*Cowles, E. R.....	1906
Fuller, G.....	1914
Marsh, H. V.....	1915
Dorchester	
Bellamy, J.....	1876
Brett, W. F.....	1872
*Caldwell, D. L.....	1914
Eddy, R. S.....	1910
*Hennessey, W. F.....	1911
*Mahoney, F. W.....	1906
Parker, G. L.....	1876
Patterson, R. E.....	1915
Simon, I. B.....	1915
Dorchester Centre	
Swain, A. N.....	1905
Dover	
Chase, A. B., Jr.....	1915
Chickering, J. H.....	1901
*Poole, J. E.....	1915
Dracut	
*Fox, E. B.....	1915
*Richardson, J. C.....	1905
East Charlemont	
Freneh, H. W.....	1910
East Dedham	
*Worthington, A. F.....	1888
Easthampton	
*Hiltbold, W.....	1912
*Putnam, E. F.....	1913
Root, W. A.....	1895
Shute, C. A.....	1913
Tannatt, W. C., Jr.....	1906
East Holliston	
*Phipps, W. R.....	1911
Staples, P. F.....	1904
East Leverett	
Adams, W. F.....	1913
East Longmeadow	
Brown, C. L.....	1894
Marsh, F. E.....	1914
Sellew, M. E.....	1896
Eastondale	
Wood, A. H. M.....	1906
East Pepperell	
*Blake, R. R.....	1908
East Taunton	
Nute, R. E.....	1914

East Wareham	
Franklin, H. J.....	1903
East Weymouth	
*Merchant, C. E.....	1887
Enfield	
*Bartlett, E. H.....	1915
Chickering, D. O.....	1876
Essex	
*Du Bois, C. M.....	1891
O'Brien, J. L.....	1913
Everett	
Gallagher, J. A.....	1912
Macy, P. A.....	1915
Reed, R. E.....	1912
Fairhaven	
Potter, D. C.....	1895
Reid, G. A.....	1914
Fall River	
Allen, R. H.....	1910
*Capen, T. A.....	1873
*Haffenreffer, A. F.....	1904
*Lincoln, E. A.....	1907
McGraw, F. D.....	1911
Pool, I. C.....	1896
Rice, T., 2d.....	1888
Feeding Hills	
Taylor, A. W.....	1914
Fitchburg	
Casey, T.....	1901
Clark, H. D.....	1893
Fisher, J. F.....	1871
Greene, I. C.....	1894
Lesure, J. W. T.....	1913
*Rose, N. R.....	1887
Florence	
*Learned, W. H.....	1909
Otis, H. P.....	1875
Warner, S. S.....	1873
Framingham	
Bullard, A. H.....	1913
Castle, F. A.....	1912
*Dearth, G. A.....	1907
Mayo, W. P.....	1884
*Rogers, H. P.....	1888
Franklin	
*Ames, F. L.....	1913
Morse, H. B.....	1911
Parmenter, E. B.....	1915
Furnace	
Slein, O. F.....	1915
Gardner	
*Coleman, L. N.....	1909
Ide, W. L.....	1909
Knight, H. O.....	1909
Gilbertville	
*Besser, S. S.....	1914
Gill	
*Blake, E. E.....	1903
Gloucester	
*Nauss, C. S.....	1892
Granby	
Davis, P. E.....	1894
Ingham, E. M.....	1914
Willey, H. C. C.....	1915
Great Barrington	
Alger, P. E.....	1909
*Curtiss, W. E.....	1910
Dellea, J. M.....	1902
Hull, J. B. Jr.....	1891
*Marran, B. J.....	1907
Turner, F. H.....	1899
Greenfield	
Clapp, C. W.....	1886
*Demond, R. N.....	1914
Field, H. J.....	1891
Putnam, J. H.....	1894
*Roberts, P. C.....	1897
Tinkham, C. S.....	1903
*Zabriskie, F. H.....	1880

Greenwich Village	
Brown, M. R.....	1912
Walker, C. D.....	1913
Groton	
Cook, L. A.....	1902
May, F. G.....	1882
Hadley	
Burke, E. J.....	1910
*Comins, W. H.....	1882
*Cook, R. T.....	1876
Montgomery, A. W.....	1898
Toole, S. P.....	1895
Hamilton	
Ware, W. C.....	1871
Hampden	
Davis, E. N.....	1911
Hanson	
Barker, L. M.....	1894
Harding	
Harvey, R. W.....	1915
*Mason, A. H.....	1895
Hardwick	
Lull, R. D.....	1911
Harvard	
*Blanchard, S. P.....	1894
Peters, A.....	1881
Harwichport	
Kelley, B. J.....	1913
*Snow, L.....	1875
Hatfield	
*Graves, E. L.....	1905
Graves, T. Jr.....	1901
*Hubbard, R. E.....	1913
Hathorne	
Allen, F. E.....	1915
Cale, G. H.....	1915
Carver, J. S.....	1913
LeDuc, A. C.....	1915
Preston, C. H.....	1883
Smith, F. A.....	1893
Haverhill	
Brooks, F. K.....	1888
*Merrill, J. C.....	1875
*Weed, P. L.....	1895
Hingham	
Harvey, L. F.....	1903
*Mahan, H. B.....	1915
Robinson, E. J.....	1912
Holden	
*Dix, J. Q.....	1875
Graham, C. S.....	1892
Holliston	
Cristman, C. E.....	1913
Dolan, C.....	1908
*Faeltens, W. C.....	1910
Holyoke	
Allen, C. M.....	1914
*Armstrong, R. H.....	1911
Bartlett, F. G.....	1893
*Ellsworth, H. B.....	1912
*Hill, C. H.....	1882
Murray, J. W.....	1913
*Sanderson, R. W.....	1873
*Valentine, (Mrs. F. M. Jones) ..	1896
Hopedale	
*Clarke, F. S.....	1887
*Frost, N. J.....	1912
Gaskill, L. W.....	1912
Hudson	
Minott, C. W.....	1883
Stowe, A. N.....	1890
Huntington	
Geer, W. E.....	1909
Kirkland, A. H.....	1894
Hyannis	
Sherman, J. P.....	1914

MASSACHUSETTS—Con.

Hyde Park	
*Becker, J., Jr.	1911
Bentley, A. G.	1911
*Karnan, P. R.	1915
Waldron, H. E. B.	1879
Indian Orchard	
*Henry, W. F.	1911
Ipswich	
Barnes, B. F., Jr.	1909
*Kinsman, W. F.	1875
*Kinsman, W. Q.	1898
Roper, H. H.	1896
Tashjian, D. B.	1901
Jamaica Plain	
*Clark, A. L.	1915
*Godvin, T. J.	1913
*MacHale, W. E.	1914
*Stearns, R. S.	1875
Tupper, G. W.	1912
Jefferson	
Ripley, G. A.	1880
Kingston	
*Hathaway, I.	1915
*Smith, P. L.	1915
Lancaster	
Livers, Miss S. D.	1907
Nissen, H.	1914
Lawrence	
*Ayer, W.	1888
*Coash, W. H.	1911
Cutter, A. H.	1894
*Helberg, H. W.	1913
Winchester, J. F.	1875
Lee	
*Shaylor, F. W.	1915
Leicester	
*Sanderson, H. T.	1891
Warren, E. E.	1911
*Whittemore, J. S.	1885
Lenox	
Munson, M. H.	1900
Leominster	
*Lane, W. F.	1913
*Moore, H. I.	1910
O'Brien, D. W.	1914
Raymond, A. N.	1912
Snow, G. H.	1872
Leverett	
*Taylor, I. H.	1910
Lexington	
Pauly, H. A.	1911
Spaulding, C. H.	1894
Wheeler, H. T.	1908
Lithia	
Barrus, G. L.	1903
Littleton	
Pratt, M. C.	1912
*Priest, R. A.	1914
*Prouty, L.	1915
Littleton Common	
*Howard, J. H.	1901
Lowell	
*Melloon, R. R.	1914
*Morey, G.	1878
*Quinn, J. H.	1913
Racicot, P. A.	1911
Root, L. A.	1901
Sherman, W. A.	1879
Ludlow	
*Birnie, A. C.	1897
*Jones, A. M.	1907
Potter, G. R.	1915
*Robb, A. J.	1910
Smead, H. P.	1894
Wallace, W. N.	1910

Lynn	
*Danks, E. F.	1886
*Dwyer, E. F.	1895
*Finnegan, J. T.	1912
Fulton, G. R.	1909
*Millbury, F. C.	1913
Malden	
Morey, H. E.	1872
Powers, R. H.	1914
*Presley, F. Y.	1914
Walker, N. K.	1914
Marblehead	
*Goldthwait, W. J., Jr.	1892
Gregory, E.	1890
*Lindsey, E.	1892
*Martin, J., 2d.	1887
*Weed, W. D.	1892
Marlboro	
Brown, F. H.	1900
*Browne, M. M.	1908
Davis, W. A.	1914
Goodale, D.	1882
Howe, E. D.	1881
Howe, G. E.	1913
Howe, W. L.	1908
*Shaughnessy, Hon. J. J.	1887
*Stratton, E. N.	1890
Marshfield	
Harlow, F. T.	1893
Marstons Mills	
Daniel, J.	1908
Mattapan	
*Clare, F. H.	1915
Medfield	
*Hall, R. S.	1912
Medford	
Barrett, E. W.	1887
*Folger, E. M.	1912
*Hatch, G. S.	1875
Larabee, E. A.	1911
Mills, G. W.	1873
*Nash, J. A.	1885
Melrose	
Allen, H. W.	1913
Bradley, J. W.	1914
Butterick, J. W.	1915
Crossman, S. S.	1909
*Heartz, F. O.	1915
Jones, D. W.	1914
Lewis, C. W.	1905
*MacDonald, N. D.	1915
Morrison, H. J.	1914
Morse, W. A.	1882
*Rendall, R. E.	1915
*Scott, L. B.	1915
*Stockwell, C. W.	1910
Summers, J. N.	1907
*White, H. B.	1915
Mendon	
*Phillips, R. E.	1915
*Taft, C. M.	1914
Methuen	
Emerson, H. B.	1892
*Leach, B. R.	1914
Middleboro	
*Shaw, C. L.	1907
*Williams, J. S.	1895
Milford	
Curley, G. F.	1893
*McCobb, E. F.	1902
Millbrook	
*Walker, A. H.	1902
Millbury	
*Gould, H. W.	1907
Hayward, W. W.	1910
*Lacouture, G. L.	1908
*Pierce, H. C.	1904
Watkins, F. A.	1907

Millis	
*Adams, E. E.	1902
Richardson, E. F.	1887
Milton	
*Bent, G. F.	1909
Ruggles, M.	1891
Monson	
Carpenter, C. W.	1906
Fay, R. S.	1913
*Rees, H. L.	1914
*Tucker, W. M.	1871
Montague	
Kelleher, J. J.	1915
*Lyman, R. R.	1905
Monterey	
Thomson, J. B.	1909
Natick	
Annis, R. E.	1910
*Cleland, W. F.	1873
McKetchnie, R. F.	1915
Sellew, L. R.	1912
Needham	
*Bond, R. H.	1887
*Fowle, S. O.	1892
New Bedford	
Allen, G. H.	1871
*Dorman, A. R.	1901
*Freifeld, J.	1913
Gray, F. L.	1912
*Hathaway, B. O.	1887
*Kasmire, G. F.	1887
*Lawton, C. F.	1876
*Leominster, W.	1907
Poole, E. W.	1896
Newburyport	
*Blakeley, F. C.	1908
Howe, W. V.	1877
*Johnson, I. H.	1888
*Jones, N. N.	1882
Little, W. S.	1913
New Salem	
Lewis, D. J.	1915
Newton	
Clark, A.	1877
*Sanger, F. H.	1876
Newton Centre	
Curtis, H. W.	1913
Newtonville	
Baker, D. E.	1878
Barry, D.	1890
Barry, T. A.	1908
Peakes, R. W.	1906
North Abington	
Brett, A. C.	1912
North Amherst	
*Cowles, W. D.	1872
Dickinson, E. H.	1888
*Dowd, D. G.	1913
*Eastman, E. B.	1912
Fulton, E. S.	1904
*Harrington, F. W.	1872
Jones, G. D.	1903
*Loomis, H. R.	1888
Parsons, A.	1903
*Parsons, H. A.	1882
Puffer, S. P.	1912
Northampton	
Atkins, E. K.	1900
*Brown, C. E.	1871
Clapp, E. K.	1912
Damon, C. M.	1911
Dickinson, E. T.	1894
*Farrar, F. A.	1892
*Gare, E. J.	1915
Lehnert, E. H.	1893
McDougall, A. F.	1913
Morse, A. J.	1894
*Parsons, J. W.	1903

MASSACHUSETTS—Con.

Northampton		
Peekham, C.	1912	
*Seldon, J. L.	1883	
Shores, H. T.	1891	
*Staab, H. B.	1913	
North Andover		
Chapman, J. O.	1907	
Stevens, A. E.	1914	
Titus, W. M. S.	1911	
North Billerica		
Hamblin, S. F.	1912	
Nickless, F. P.	1910	
Northboro		
Allen, H. F.	1897	
Allen, J. W.	1897	
Browne, C. W.	1885	
*Falby, F. R.	1897	
Maynard, S. T.	1872	
*Phelps, A. A.	1903	
Sparrow, L. A.	1871	
*Wadsworth, R. E.	1909	
North Dartmouth		
*Hawes, C. P.	1915	
Poole, E. M.	1903	
North Eastham		
*Campbell, C. A.	1912	
North Easton		
*Hanlon, H. C.	1902	
Northfield		
Callender, T. R.	1875	
North Grafton		
Lewis, J. K.	1915	
North Hadley		
Clark, J. W.	1872	
*Grebin, M. A.	1914	
*Russell, H. O.	1906	
North Hanson		
Oertel, C. A.	1910	
North Hatfield		
Field, S. H.	1888	
North Middleboro		
*Bears, A. W.	1911	
North Reading		
*Edmands, E. C.	1908	
Eisennaure, J. L.	1913	
North Scituate		
*Bush, E.	1891	
North Stoughton		
*Ames, W. C.	1872	
North Wilbraham		
*Haskins, L. E.	1915	
Merril, N. P.	1875	
North Wilmington		
Eames, A. G.	1891	
Norwood		
*Fisher, L. C.	1915	
*Fittz, A. H.	1897	
Orange		
Smith, H. F. M.	1881	
Osterville		
Daniel, E. S.	1913	
Otter River		
Stone, G. S.	1886	
Oxford		
*Taft, R. C.	1915	
Palmer		
*Brainerd, J. W.	1871	
Peabody		
*Brown, H. L.	1887	
MacKintosh, R. B.	1886	
Tucker, W. G.	1913	

Pepperell		
Shattuck, L. A.	1908	
Petersham		
Edwards, F. L.	1908	
Pittsfield		
*Babbitt, G. H.	1874	
*Coleman, R. P.	1897	
Cooke, T. F.	1904	
*Fahey, J. J.	1904	
Gibbs, R. M.	1912	
*Graves, G. G.	1871	
Leslie, C. T.	1901	
*Messer, A. I.	1912	
O'Hearn, G. E.	1904	
Wilkins, A. E.	1915	
Willis, G. N.	1905	
Plymouth		
*Bittinger, F. J.	1915	
Cooper, J. W.	1882	
Shurtleff, W. D.	1896	
Princeton		
Crosby, H. D.	1905	
Provincetown		
*Swift, F. M.	1876	
Quincy		
Bennett, J. I.	1915	
Crane, H. E.	1892	
Nichols, N. J.	1913	
Paulsen, G. H.	1910	
Readville		
Mann, G. H.	1876	
Revere		
Dalrymple, A. C.	1915	
*Hall, A. S.	1880	
Rock		
*Braley, M. L.	1915	
Rockland		
*Lanigan, W. J.	1907	
*Stoddard, S. H.	1896	
Rockport		
*Colcord, W. R.	1889	
Roslindale		
Davis, F. W.	1889	
Kelley, A. J.	1913	
*Martin, N. L.	1909	
*Quincy, K.	1915	
Roxbury		
*Cohen, S. A.	1915	
*Earle, H. W.	1914	
Freedman, S. L.	1914	
Levine, H. W.	1914	
Mendum, S. W.	1910	
Taylor, F. L.	1890	
Russell		
*Copeland, A. B.	1886	
Rutland		
Drury, L. F.	1913	
*Wheeler, M. H.	1913	
Salem		
Dana, H. W.	1899	
Fuller, R.	1915	
*Harriman, V. S.	1914	
*Merrill, C. E., Jr.	1905	
*Robb, G. H.	1911	
Upton, E. F.	1914	
*Wheeler, H. L.	1913	
*Wright, F. V.	1914	
Sandwich		
Eldred, F. C.	1873	
Scituate		
Hatch, H. T.	1913	
Segreganset		
Gaskill, R. H.	1913	
Spicer, E. G.	1915	
Sharon		
Belden, E. H.	1888	

Sheffield		
Boardman, E. L.	1894	
Wakefield, A. T.	1873	
Shelburne		
Taylor, G. E.	1892	
Sherborn		
Bishop, C. A.	1915	
*Clark, G. H.	1915	
Heffron, F.	1914	
*Jackson, J. C.	1915	
Moberg, E. S.	1915	
Shirley		
Fowler, F. H.	1887	
Shrewsbury		
Cloues, W. A.	1910	
*Cook, M. E.	1897	
Harlow, H. J.	1893	
Holland, A. W.	1910	
*Prouty, R. H.	1913	
Tower, W. R.	1915	
Webb, C. R.	1909	
Shutesbury		
Hunting, N. J.	1901	
Somerville		
*Beers, N. L.	1915	
Chase, E. L.	1909	
*Cohen, H.	1912	
Pike, J. S., Jr.	1915	
South Acton		
Piper, R. W.	1911	
South Amherst		
Hutchings, H. C.	1913	
Porter, B. A.	1914	
Southampton		
*Gunn, C. A.	1911	
Parsons, W. A.	1888	
South Boston		
*Bacon, R. A.	1906	
Dooley, T. P.	1913	
*Jenney, H. H.	1914	
Mayer, J. L.	1913	
Southbridge		
Hebard, E. B.	1914	
South Byfield		
*Caldwell, D. S.	1913	
South Duxbury		
*Shirley, J. N.	1914	
South Framingham		
*Curley, W. J.	1896	
*Smart, H. L.	1913	
South Hadley		
*Barston, H. D.	1913	
*Judd, W. H.	1901	
Kinney, A. S.	1896	
Montague, A. H.	1874	
*Wilson, A. R.	1877	
South Hadley Falls		
*Clancy, E. F.	1912	
*Drohan, J.	1910	
Frye, C. R.	1914	
*Griffin, W. G.	1914	
*Judd, C. A.	1876	
*Kennedy, T. J.	1915	
*Smith, R. E.	1905	
*Strong, S. H.	1913	
South Hamilton		
Dodge, G. R.	1875	
South Hanson		
*Hutchinson, R. E.	1914	
*Thayer, G. M.	1915	
South Lancaster		
*Houghton, A. R.	1915	
*Kilbourn, W. G.	1914	
South Lincoln		
Sheehan, D. A.	1913	

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South Sudbury	
Bartlett, J. L.	1897
Clark, E. T.	1892
*Eaton, H. N.	1892
*Fairbank, H. N.	1915
Hall, J. C.	1902

South Weymouth	
*Burrell, R. P.	1910
Ellis, B. W.	1913

Southwick	
Gillett, C. S.	1908
*Gillett, E.	1874
Gillett, K. E.	1908

Spencer	
Bacon, L. H.	1894
Bemis, W. L.	1895
*Green, H. H.	1907
*Starr, E. J.	1894

Springfield	
Bacon, T. S.	1894
*Barker, J. K.	1886
Barlow, W. D.	1909
*Belden, A. M.	1891
Birnie, W. P.	1871
*Bliss, W. H.	1911
Boynnton, W. I.	1892
*Brown, M. H.	1895
*Cole, W. R.	1902
*Davis, J. A.	1899
*Faneuf, A. G.	1892
*Farrar, A. D.	1906
Farrar, P. W.	1908
Geer, M. F.	1909
Headle, H. W.	1913
Headle, M.	1913
*Heath, C. B.	1913
*Higgins, N. F.	1893
Howe, G. D.	1882
*Howe, H. H.	1911
Hutchings, F. F.	1908
Jenks, A. R.	1911
Johnson, A.	1915
King, C.	1907
*Kingman, W. H.	1872
Kramer, A. M.	1896
Lane, M. C.	1915
Leonard, G.	1871
*March, A. L.	1900
*Meade, W. G.	1882
*Merritt, W. H.	1887
*Monroe, D. M.	1914
Myrick, H.	1882
Needham, L. W.	1914
Noble, H. G.	1909
*Palmer, J. P.	1914
*Perkins, O. H.	1915
*Pixley, M. S.	1877
*Ranshouen, L. A.	1905
*Rice, C. A. A.	1907
*Roy, Miss G. C.	1910
Severance, V. L.	1915
Shaw, E. D.	1872
Sherman, M. F.	1915
Smith, B. H.	1899
*Swazey, W. W.	1872
Terry, L.	1912
*Tinker, C. A.	1903
Vener, B.	1915
Wing, J. G.	1914
*Wolcott, H. R.	1898

Sterling	
*Davis, A. E.	1884
Sanborn,	
(Mrs. W. O. Taft)	1905
Taft, W. O.	1906

Sterling Junction	
Sawyer, W. F.	1908

Still River	
Campbell, M. D.	1914

Stockbridge	
Barnes, H. L.	1905
Stoughton	
Bagley, S. C.	1883
Sturbridge	
Haynes, F. T.	1910
Vinton, G. N.	1910

Sunderland	
Clark, C. G.	1898
Conant, A. T.	1911
Hubbard, A. W.	1909
Hubbard, G. C.	1899
Smith, G. P.	1879
*Warner, L. P.	1915
Warner, R. W.	1914
Warner, R. A.	1912
Warner, T. L.	1908
Whitmore, P. F.	1915
Williams, F. O.	1890
Williams, M. H.	1892

Sutton	
Clark, E. S., Jr.	1914
Swampscott	
Blaney, J. P.	1910
Chase, H. C.	1908
Mudge, E. P.	1906

Taunton	
*Harrington, R. C.	1913
*King, A.	1871
Southwick, A. A.	1875
Walker, R. P.	1914

Templeton	
*Carter, S. M.	1875
*Johnson, R. E.	1914
Pease, L. N.	1913

Tewksbury	
*Denham, E. T.	1907
Thorndike	
*Breen, T. R.	1887

Topsfield	
*Williams, H. C.	1915

Townsend	
Campbell, M. A.	1900
Townsend Harbor	
*Blake, R. C.	1914

Truro	
*Peters, T. H.	1913

Turners Falls	
*Bean, T. W.	1909
*Farnsworth, R. L.	1897
Harlow, J. A.	1912
Hosmer, C. I.	1910

Upton	
Whitney, C. A.	1889

Vineyard Haven	
*Crowell, C. A., Jr.	1900
*Walker, H. E.	1900

Waban	
Upton, R. M.	1915

Wakefield	
*Eaton, P. B.	1915
Payne, R. A.	1914
*Strong, A. L.	1909
Whitney, C. E.	1912

Walpole	
*MacDonald, D. A.	1914

Waltham	
*Baird, E. F.	1915
*Moore, E. F.	1915
*Swift, G. A.	1871
*Ward, T.	1914
Wellington, B.	1915
Willard, G. B.	1892

Ware	
*Anderson, H. H.	1915
Beeman, F. S.	1910

*Buffington, C. O.	1885
Burby, L. W.	1913
*Winslow, E. D.	1886

Wareham	
Macomber, E. L.	1901
Stone, A. H.	1880

Warren	
Day, G. A.	1915
*Day, W. L.	1885
Hitchcock, D. G.	1874
*Warriner, A. A.	1873

Warrick	
*Witherell, G. A.	1904

Watertown	
*Davenport, A. M.	1891
Diekinson, D. W.	1890
*Howe, C. L.	1910
*Spoonner, F. A.	1876
*Thompson, C. L.	1904
*Turner, L. B.	1913

Wellesley	
*Heatley, D. B.	1912
Jacobs, L. H.	1914
Whitney, F. W.	1913

Wenham	
Dodge, A. W.	1912
Patch, R. H.	1911

West Acton	
*Whitcomb, A. M.	1894

West Berlin	
Felton, T. P.	1890
Nutting, C. A.	1896

Westboro	
Bartholomew, Miss P.	1908
*Bruce, E. C.	1905
*Gates, C. A.	1909
*Kelly, E. N.	1910
*Knox, H. C.	1907
Nourse, A. M.	1889
Smith, S. E.	1899

West Bridgewater	
*Alger, G. W.	1889
*Howard, J. C.	1879

West Brookfield	
Phelps, H. D.	1909

West Chesterfield	
Cole, A. T.	1913

Westfield	
Allen, P. W.	1911
Clegg, F. J.	1914
Foster, S. B.	1914
*Fowler, J. H.	1886
*Gowdy, H. M.	1882
Higgins, A. W.	1907
*Searle, G. W.	1907

Westford	
Banister, S. W.	1915
Labouteley, G. E.	1911

West Harwich	
Nickerson, J. P.	1898

West Lynn	
Norton, C. A.	1897

West Medford	
*Baker, M.	1914
*Huse, F. R.	1889

West Medway	
Howe, C. S.	1887

West Millbury	
*Pierce, H. T.	1907

Westhampton	
Montague, E. J.	1915

Westminster	
Mossman, F. W.	1890

West Newbury	
Grover, R. B.....	1872
West Newton	
*Bickford, H. M., Jr.	1914
*Colton, W. W.....	1906
Howard, H. M.....	1891
Hoyt, F. S.....	1893
*Hoyt, F. S.....	1914
*Knowles, W. F., Jr.	1882
Nielsen, G. A.....	1911
*Smith, F. A.....	1915
West Roxbury	
Covill, J. W.....	1913
Howard, S. M.....	1893
Manley, L.....	1894
*Richards, G. E.....	1891
West Rutland	
*Loker, W. M.....	1911
West Somerville	
Burt, Miss. H. F.....	1915
*Dobanian, S. M.....	1913
*Merrill, C. E.....	1911
*Stewart, G. O.....	1914
Whidden, B. C.....	1914
West Springfield	
*Bagg, E. O.....	1895
Hatch, W. B.....	1905
*Smith, H. E.....	1912
*Sykes, C. S.....	1905
West Sterling	
Shepard, L. J.....	1896
West Stockbridge	
Tobey, F. C.....	1895
Westwood	
Crane, H. L.....	1900
Weymouth	
*Stevens, F. O.....	1906
Whately	
*White, H. K.....	1888
Wilbraham	
*Ryder, H. W.....	1913
Winchester	
*Barstow, W. H.....	1874
*Cabot, G. D.....	1912
Perkins, D. E.....	1882
*Perkins, E. L.....	1903
Winter Hill	
*Hutchison, R. B.....	1913
Lyon, H.....	1913
*Richardson, H. L.....	1903
Rideout, H. N. W.....	1887
Winthrop	
*Callard, J. C.....	1915
Cutting, R. E.....	1908
*Murray, J. K.....	1915
*Pigott, E. R.....	1914
*Russell, F. N.....	1890
*Tonry, A. J.....	1915
Woburn	
Arnold, F. L.....	1891
Wollaston	
Fowler, H. M.....	1894
Holcomb, C. S.....	1905
*Huntington, R. E.....	1905
Melendy, A. E.....	1893
Worcester	
*Baird, E. J.....	1912
*Bigelow, W. H.....	1910
*Carter, H. R.....	1908
Churchill, G. C.....	1914
Clark, N. R.....	1913
*Clementson, L. T.....	1907
Cowles, F. C.....	1872
*Draper, J. E.....	1908

*Engstrom, N.....	1907
*Fales, G.....	1915
Fitzgerald, D. J.....	1915
Hall, R. C.....	1915
*Handy, L. M.....	1909
Hemenway, H. D.....	1895
*Jones, E. S.....	1882
*Kane, P. V.....	1915
Kimball, F. E.....	1872
*Leach, F. H.....	1876
Marshall, J. L.....	1896
McGarr, T. A.....	1912
Melican, G. D.....	1915
Miller, D. P.....	1908
Moore, H. W.....	1896
*Munger, G. D.....	1915
Neale, H. J.....	1909
O'Flynn, G. B.....	1912
*Parker, C. H.....	1893
*Perry, A. D.....	1881
*Putnam, H. A.....	1882
*Russell, E. E.....	1891
*Smith, H.....	1915
Swan, R. W.....	1879
*Sweet, C. R.....	1909
Thompson, E. E.....	1871
*Thompson, E. F.....	1894
*Thompson, G. H. A.....	1898
White, C. H.....	1909
Wood, H. H.....	1912
*Woodward, W. F.....	1910
Wright, E. S.....	1915

MICHIGAN

Detroit	
Landers, M. B.....	1900
Maynard, H. E.....	1899
*Norris, E. J.....	1912
East Lansing	
Halligan, C. P.....	1903
Lyman, R. P.....	1892
Small, F. W.....	1914
Taft, L. R.....	1882
Eaton Rapids	
*Smith, C. W.....	1899
Munising	
*Jewett, H. D.....	1914

MINNESOTA

Canby	
Ostrolenk, B.....	1911
Cannon Falls	
*Harris, L. L.....	1882
Minneapolis	
*Call, A. E.....	1910
Philbrick, W. E.....	1912
Whitney, W. C.....	1872
St. Paul	
Hayes, H. K.....	1908
Lee, L. K.....	1875
Wellington, R.....	1906
Sherburn	
*Rotsh, C. L.....	1875
Virginia	
Philbrick, E. D.....	1908

MISSISSIPPI

Jackson	
Hubert, Z. T.....	1904
McComb	
*Sherman, C. F.....	1897

MISSOURI

Charleston	
Barber, G. W.....	1913
Kansas City	
Wales, R. W.....	1912
Woodbury, R. P.....	1878
St. Louis	
Jennison, H. M.....	1908
*Jones, F. D.....	1873
Noyes, J.....	1909
*Tucker, F. D.....	1887

MONTANA

Bozeman	
Cooley, F. S.....	1888
Cooley, R. A.....	1895
Parker, J. R.....	1908
Parker, R. R.....	1912
Butte	
*Beebe, J. C.....	1909
Great Falls	
*Campbell, C. H.....	1879
*Sanford, G. O.....	1894
Miles City	
Miles, G. M.....	1875
Missoula	
Shaw, E. I.....	1912

NEBRASKA

Columbus	
Allen, C. F.....	1908
Dickerson, R. S.....	1879
Lincoln	
Nicolet, T. W.....	1914
Nebraska City	
Dwyer, C. E.....	1902
Norfolk	
*Sattler, H. C.....	1881

NEW HAMPSHIRE

Alton	
*Dee, J. F.....	1912
Andover	
Whippen, C. W.....	1914
Ashuelot	
*Allen, E. W.....	1894
Berlin	
Gilgore, I. C.....	1911
*Lightbody, W. C.....	1910
Taft, W. E.....	1890
Charlestown	
Tower, A. L.....	1914
Derry	
Pellett, J. D.....	1914
Derry Village	
*Ranney, W. H.....	1893
Dover	
Cande, D. H.....	1915
Durham	
Wilson, F. H., Jr.....	1909
Fitzwilliam Depot	
*Treat, C. E.....	1909
Freedom	
*Brooks, W. C.....	1881
Hampton Falls	
*Healey, G. C.....	1873

NEW HAMPSHIRE—Con.

Hanover	
*Gibson, D. W.....	1914
*Saben, M. B.....	1915
Hinsdale	
Young, E. B.....	1912
Keene	
*Guild, L. F.....	1913
Strange, Miss. S. J.....	1914
Lisbon	
Tower, R. E.....	1915
Littleton	
Carpenter, D. F.....	1886
Sullivan, M. J.....	1895
Manchester	
O'Grady, J. R.....	1909
Nashua	
Allen, F. S.....	1882
*Bancroft, J. F.....	1872
Hammar, J. F.....	1896
Saunders, E. B.....	1902
Newton	
Davis, P. A.....	1908
North Hampton	
*Hobbs, J. O.....	1876
Pelham	
*Currier, R. H.....	1913
Peterboro	
Bishop, E. A.....	1883
Caldwell, W. H.....	1887
So. Danbury	
Turner, E. H.....	1910
Suncook	
*Hamburger, A. F.....	1908
Wilton	
Archibald, H. H.....	1915
Winchester	
*Haskell, W. A.....	1914
Woodsville	
*Whitney, J. F.....	1907

NEW JERSEY

Arlington	
*Stearns, H. E.....	1897
Athenia	
Cole, (Mrs. A. Winkler) ..	1913
Atlantic City	
*Roberts, C. E.....	1911
Belvidere	
*Paul, A. R.....	1905
Boonton	
*Condit, C. D. H.....	1892
Carteret	
Bangs, B. W.....	1908
Holland, H. L.....	1912
East Orange	
*Jackson, H. S.....	1875
East Rutherford	
Major, J.....	1914
Elizabeth	
Brooks, A. W.....	1914
Moore, R. B.....	1888
Winn, E. L.....	1911
Englishtown	
Stockbridge, F. G.....	1892
Freehold	
*Ely, W. I.....	1875
Hammononton	
Myrick, L.....	1878
*Watkiss, J. E.....	1874

Hoboken	
Tekirian, B. O.....	1885
Jersey City	
Bacon, S. C.....	1903
Hastings, A. T., Jr.....	1906
Kenil	
*Brown, I. C.....	1911
Long Branch	
*Maps, C. H.....	1909
Martinsville	
Post, G. A.....	1913
Millburn	
Hatfield, W. H.....	1915
Montclair	
Anderson, J. A.....	1908
*Holmes, S. J.....	1882
Morris Plains	
*Brett, C. E.....	1905
Newark	
Coleman, W. J.....	1908
Smith, S. L.....	1902
*Taylor, E. E.....	1895
Walker, J. H.....	1907
Warden, R. D.....	1898
New Brunswick	
Blake, M. A.....	1904
Coleman, D. A.....	1914
Farley, A. J.....	1908
Masse, S. M.....	1915
Schermerhorn, L. G.....	1910
Nutley	
Sawyer, A. H.....	1891
Orange	
Cutter, F. A.....	1907
Paterson	
*Gold, F. L.....	1908
Pennington	
*Williams, G. E.....	1911
Penn's Grove	
Chapman, L. W.....	1908
Plainfield	
Gay, R. P.....	1905
Rutherford	
*Komp, W. H. W.....	1915
Stewartsville	
Coleman, I.....	1913
Wehawken	
*Baker, J. B.....	1901

NEW MEXICO

Laplata	
Fisherdict, C. W.....	1887
Maxwell	
Caffrey, D. J.....	1909
Roswell	
Fiske, R. J.....	1910
Yeaw, F. L.....	1905

NEW YORK

Albany	
Eastman, P. M.....	1908
Felt, E. P.....	1891
Amsterdam	
Kelton, J. R.....	1905
Ballston Spa	
*Gibbs, R. B.....	1915
Binghampton	
Eastman, J. F.....	1907
Brooklyn	
*Adams, F. E.....	1874

Baker, D. F.....	1913
Fitzgerald, J. J.....	1912
Frost, A. F.....	1900
Haskell, W. H.....	1915
Walker, C. F.....	1894
West, D. N.....	1902
Wright, G. H.....	1898
Buffalo	
*Barton, C. H.....	1893
Belden, J. H.....	1902
*Bredemeier, C.....	1915
Clark, M. H., Jr.....	1907
Filer, H. B.....	1906
*Paine, A. W.....	1887
Canton	
Phelps, C. S.....	1885
*Townesley, H. M.....	1880
Chautauqua	
Hyde, H. G.....	1915
Cooperstown	
Peters, C. H.....	1914
Deposit	
*Wheeler, G. W.....	1886
Dobbs Ferry	
Morse, W. L.....	1895
Evans Mills	
*Beebe, W. C.....	1915
Fishkill	
Cary, W. W.....	1880
Floral Park, L. I.	
*Casparian, G.....	1882
Geneseo	
*Randolph, (Mrs. C. J. Hill.)....	1909
Geneva	
Hodgkiss, H. E.....	1902
Wellington, J. W.....	1908
Greenport	
*Courtney, H. S.....	1899
Hamilton	
*Risley, C. E.....	1900
Hammondsport	
Dayton, J. W.....	1913
Hartsdale	
Brewer, C. H.....	1913
Hastings-on-Hudson	
Woolson, G. C.....	1871
Hempstead, L. I.	
*Page, H. S.....	1892
Highland	
Weaver, W. J.....	1912
Hilton	
White, H. M.....	1904
Hudson	
Lindblad, R. C.....	1909
Ithaca	
Gilbert, A. W.....	1904
*Rosenbaum, J.....	1911
Thayer, C. L.....	1913
White, E. A.....	1895
Larchmont	
*Bullard, W. E.....	1872
Mamaroneck	
*Henderson, E. H.....	1895
Marathon	
*Miller, H. H.....	1913
Milton-on-Hudson	
Clarke, W. R.....	1910
Mohawk	
*Boutelle, C. A.....	1901
Morrisville	
Sanctuary, W. C.....	1912
Mt. Kisco	
Leete, R. F.....	1914

NEW YORK—Con.

Mt. Lebanon	
*Allen, E. B.	1897
Mt. Vernon	
Brewer, H. W.	1914
Newburgh	
Nourse, D. O.	1883
New York City	
*Allen, F. C.	1887
Ateshian, O. H.	1886
Ayres, W.	1886
Barrett, J. F.	1875
Bassett, A. L.	1871
Beals, A. T.	1892
Bent, W. R.	1912
Bursley, H. B.	1913
Chapin, H. E.	1881
Codding, G. M.	1909
*Cook, R. C.	1879
Cutter, J. A.	1882
de Luce, F. E.	1896
Dexter, E. K.	1914
*Dunne, R. E.	1914
*Edmonds, S. W.	1914
Eldridge, H. L.	1914
Fagerstrom, L. E.	1912
Fairfield, F. H.	1881
Foot, S. D.	1878
Gay, W. W.	1891
Hadfield, H. F.	1914
Hall, G. M.	1915
*Haug, C. A.	1915
Hazen, M. S.	1910
Heath, H. G. K.	1878
Henderson, F. H.	1893
Hovia, A. A.	1883
Hull, E. T.	1900
Johnson, W. C.	1910
*Kelley, A. C.	1910
Larsen, N. P.	1913
*Lublin, A. W.	1884
*Lumhard, J. E.	1889
*Morris, F. W.	1872
*Oppel, E. I.	1912
Paige, G. R.	1908
*Parker, J.	1894
*Parsons, R.	1913
*Platt, J. C.	1882
*Pray, R. P.	1907
Price, J. A.	1915
Rawson, E. B.	1881
*Rogers, M. T.	1876
Russell, W. D.	1871
*Smith, B. S.	1881
*Stone, H. F.	1892
Thompson, S. C.	1872
Towne, E. G.	1915
*Urner, F. G.	1877
Walker, C. M.	1899
*Warden, J. K.	1902
Whalcy, J. S.	1909
Wheeler, C. E.	1914
Whitaker, C. L.	1905
*Young, D. B.	1911
Niagara Falls	
*Talbot, R. H.	1914
No. Tonawanda	
Hildreth, P. H.	1915
Nyack-on-Hudson	
*Dutcher, J. R.	1899
Eaton, J. S.	1898
Eaton, W. A.	1886
Otego	
Birdsall, W. J.	1913
Parkville, L. I.	
*Mildeberger, C. V.	1875
Petersburg	
*Morse, S. L.	1896

Philmont	
*Lindsey, F. B.	1882
Poughkeepsie	
Morse, R. W.	1902
Rochester	
*Elder, W. A.	1914
Hutchings, J. T.	1889
Salem	
*Parker, J. S.	1888
Syracuse	
Bowman, C. A.	1881
Francis, H. R.	1910
Washingtonville	
Howell, H.	1885
West Branch	
Foley, T. P.	1895

NORTH CAROLINA

Charlotte	
Draper, E. S.	1915
Crestmont	
Greenleaf, G. F.	1913
Glenwood	
Young, C. E.	1881
Greensboro	
Bragg, R. C.	1914
Goodwin, M. N.	1915
Jefferson	
Brown, H. D.	1914
Mt. Holly	
*Nims, L.	1878
Murphy	
*Heighway, S. C.	1880
West Raleigh	
Cooper, E. H.	1913
Stanford, E. E.	1915
Wilmington	
*Eddy, J. R.	1897
Winston Salem	
*McNayr, R. S.	1911

NO. DAKOTA

Elbowoods	
*Eaton, H.	1875
Hope	
*Wood, L.	1880

OHIO

Akron	
*Alibee, G. O.	1914
Chagrin Falls	
Edgerton, A. M.	1914
Hill, N. H.	1911
Cincinnati	
Monahan, J. V.	1909
Cleveland	
Bartlett, E. R.	1915
Bodfish, E. H.	1912
Brandt, L.	1910
Bursley, A. P.	1911
Howe, C. S.	1878
Jones, R. S.	1895
Taylor, A. D.	1905
Tupper, A. S.	1914
*Brydon, R. P.	1906
Staples, H. F.	1893
Columbus	
Lyman, J. F.	1905
Plumb, C. S.	1882

East Cleveland	
Williams, E. R.	1912
Geneva	
Brown, H. A.	1913
Kent	
*Davey, J. A.	1911
Dunbar, E. W.	1914
Leavittsburg	
*Turner, L. H.	1909
Ravenna	
*Whittaker, E. C.	1911
Salem	
*Clark, W. J.	1873
Toledo	
Brown, L. C.	1910
Wooster	
Whitmarsh, R. D.	1908

OKLAHOMA

Boley	
Hood, W. L.	1903

OREGON

Central Point	
Edminster, A. F.	1913
Cornelius	
Hobbs, J. A.	1874
Corvallis	
Lewis, C. I.	1902
Peck, A. L.	1904
Fairview	
Bowen, H. C.	1903
Forest Grove	
Rockwood, L. P.	1912
Granite	
West, H. C.	1892
Mt. Hood	
*Mann, H. J.	1894
Portland	
Chase, W. E.	1887
*Cronyn, T. R.	1909
*Gile, A. D.	1899
Henshaw, F. F.	1904
*Prouty, F. A.	1911
Rogue River	
Chandler, E. P.	1874
St. John	
Chace, W. F.	1907

PENNSYLVANIA

Ardmore	
Peters, F. C.	1907
Bethlehem	
Shimer, B. L.	1888
Carlisle	
Lyman, R. W.	1871
Carnegie	
*Phillips, L.	1903
Catasauqua	
Williams, D.	1915
Connellsville	
Christie, E. W.	1914
Cynwyd	
*Chadbourne, A. H.	1885
E. Stroudsburg	
Cory, H.	1913
Farm School	
Bishop, W. H.	1882
Prouty, P. H.	1911
Washburn, J. H.	1878

PENNSYLVANIA—Con.

Hanover	
*Charmbury, T. H.....	1897
Harrisburg	
Craighead, W. H.....	1906
Kellogg, J. W.....	1900
Morrisville	
Black, H. C.....	1914
Norristown	
*Kriebel, A. R.....	1914
Parnassus	
Knapp, E. E.....	1888
Philadelphia	
Clafin, L. C.....	1902
Crocker, C. S.....	1889
Fairbanks, H. S.....	1895
Fowler, A. L.....	1880
Goessmann, C. I.....	1897
*Heyl, J. E.....	1874
Holden, J. L.....	1913
Lane, C. B.....	1895
Plumb, F. H.....	1902
Smith, C. A.....	1911
Tolman, W. N.....	1887
Waldron, R. A.....	1910

Pittsburgh	
*Curtis, J. G.....	1907
Gelinas, L. E.....	1912
Morse, H. J.....	1914
State College	
Adams, J. F.....	1911
Parsons, S. R.....	1911
Wilde, E. I.....	1912
Swarthmore	
Ladd, E. T.....	1905
West Chester	
Ackerman, A. J.....	1912

RHODE ISLAND

Abbottrun	
Flagg, C. O.....	1872
Allenton	
*Thompson, L. I.....	1903
Chepachet	
*Sprague, W. A.....	1889
East Greenwich	
Madison, F. S.....	1912
Kingston	
Cobb, G. R.....	1908
Damon, S. C.....	1882
*Damon, S. R.....	1914
Fitts, F. O.....	1912
Hartwell, B. L.....	1889
Howard, L. P.....	1914
Kinney, L. F.....	1888
Lundgren, A. R.....	1914
Merkle, G. E.....	1912
Meshanticut Park	
Read, F. H.....	1896
Pawtucket	
Russell, H. L.....	1890
Providence	
Cushman, Miss E. C.....	1905
*Drowne, G. L.....	1894
Duncan, R. F.....	1886
Fisher, W. S.....	1898
*Hayward, R. L.....	1896
Hubbard, H. F.....	1878
*Luther, G. C.....	1871
Pillsbury, J. J.....	1913
*Rhodes, E. E.....	1905
*Smith, J. M.....	1874
Walker, H. C.....	1915

Woonsocket	
*Rankin, A. B.....	1871

SOUTH CAROLINA

Charleston	
*Lake, J. E.....	1913
Orangeburg	
Hubert, B. F.....	1912

SOUTH DAKOTA

Sioux Falls	
Martin, W. E.....	1876

TENNESSEE

Athens	
Taylor, F. P.....	1881
Knoxville	
Willis, L. G.....	1909
Nashville	
Carruthers, J. T.....	1907
Hill, C. C.....	1914

TEXAS

Beaumont	
Angier, H. W.....	1913
Bellevue	
*Manton, W. J.....	1883
Ben Bolt	
*Stacy, C. E.....	1899
Buckeye	
Kenney, F. A.....	1913
Dallas	
Wood, H. F.....	1907
Eagle Pass	
Nickerson, G. P.....	1911
Houston	
Paige, W. C.....	1891
Raymondville	
*Wood, A. R.....	1891

UTAH

Provo	
*Sprague, C. E.....	1905

VERMONT

Ascutneyville	
*Bristol, E. F.....	1880
Bellows Falls	
*Kelly, H. T.....	1903
Bethel	
*Bass, E. L.....	1879
Brandon	
Baird, H. A.....	1913
Brattleboro	
*Barrows, F. K.....	1873
Clark, L. F.....	1897
Bristol	
Selden, J. L.....	1913
Burlington	
Hills, J. L.....	1881
Jones, C. H.....	1890
Grand Isle	
Huntington, S. P.....	1913
Hyde Park	
Crosby, H. P.....	1909

Isle La Motte	
Samson, S. D.....	1913
Montpelier	
Blanchard, W. H.....	1874
Dole, S. A.....	1915
Northfield	
Howard, S. F.....	1894
Pittsford	
*Leonard, L. E.....	1910
Putney	
Alpin, G. T.....	1882
Campbell, F. G.....	1875
Richford	
*Marvin, S. B.....	1894
St. Johnsbury	
*Hamilton, P.....	1912
Thetford Centre	
*Vaughan, R. H.....	1896
West Burke	
*Spencer, R. S.....	1914
Wilmington	
Howe, R. W.....	1913
Winoski	
*Shuttleworth, E. L.....	1907

VIRGINIA

Blacksburg	
Smulyan, M. T.....	1909
East Falls Church	
*Hunter, H. C.....	1897
Fishersville	
Fletcher, S. W.....	1896
Hampton	
Neal, R. T.....	1913
Norfolk	
*Smith, A. H.....	1909
Pennington Gap	
*Nicoll, W.....	1914
Petersburg	
*Richardson, G. T.....	1909
Richmond	
Carpenter, F. B.....	1887
French, G. T.....	1906
Grant, H. D.....	1915
Vienna	
*Dudley, J. E., Jr.....	1911
Turner, W. F.....	1908

WASHINGTON

Clinton	
*Orr, L. J.....	1910
*Orr, P. E.....	1910
Everett	
Quigley, R. A.....	1904
Parkland	
Strickland, G. P.....	1871
Seattle	
Allen, W. E.....	1903
*Chaplin, J. D. H.....	1883
*Palmer, R. M.....	1886
South Bend	
Couden, F. D.....	1904
Spokane	
*Wood, Wilbur.....	1881

WEST VIRGINIA

Morgantown	
Dacy, A. L.....	1902

WISCONSIN**Cadott**

*Mallory, W. A. 1877

Lake Geneva

*Davidson, R. P. 1892

Madison

Tottingham, W. E. 1903

Milwaukee

Bates, C. 1908

FOREIGN**Africa**

Gowdy, C. C. 1908

Lounsbury, C. P. 1894

China

*Chun, W. Y. 1913

Hsieh, E. L. 1909

*Huang, C. H. 1911

Jen, H. 1909

Liang, L. K. 1908

Lin, D. Y. 1912

*Po, S. L. 1915

*Racicot, A. A. 1906

*Tong, Y. H. 1912

*Tsang, O. H. 1914

India

Knight, J. B. 1892

Japan

*Arimoto, S. 1907

Kuroda, S. 1895

Mishima, Y. 1888

Nagai, I. 1911

Saito, S. 1896

Tsuda, G. 1896

*Yamamura, K. 1893

Malay States

Sauchelli, V. 1915

Philippine Islands

Edwards, H. T. 1896

Ells, G. W. 1913

*Newcomb, R. W. 1910

Thompson, C. B. 1907

EUROPE**England**

Rice, C. L. 1901

Turkey

Adjemian, A. G. 1898

Nersessian, P. N. 1903

NORTH AMERICA**Canada**

*Baird, C. H. 1906

Brown, G. M., Jr. 1909

Higgins, C. H. 1894

*Jaqueth, I. S. 1885

Lodge, C. A. 1912

Lovell, C. O. 1878

McLaine, L. S. 1910

Sharpe, A. H. 1911

Cuba

Cardin, P. P. 1909

Dickinson, W. E. 1907

Herrero, J. M. 1890

Leonard, W. E. 1910

Pray, F. C. 1906

Thurston, F. E. 1908

*Young, R. B. 1914

Hawaiian Islands

Bartlett, E. G. 1907

Bokelund, C. S. 1914

Borden, R. J. 1913

French, J. D. 1913

*Goodell, J. S. 1894

Larsen, L. D. 1908

*Nowell, A. M. 1897

Partridge, F. H. 1910

Putnam, C. S. 1909

Sahr, G. W. A. 1914

Willard, H. F. 1911

Mexico

Canto, Y. H. 1900

Jones, H. F. 1913

Sastre, S. V. 1896

Panama

*Nash, E. D. 1871

Porto Rico

Armstrong, W. H. 1899

Beaman, D. A. 1899

Cowles, H. T. 1910

Forbush, W. C. 1913

*Merrill, G. B. 1911

Smith, R. I. 1901

Tower, W. V. 1903

Van Zwaluwenburg, R. H. 1913

Santo Domingo

Weigel, A. G. 1914

SOUTH AMERICA

*Gregory, J. H. 1893

*Howe, H. F. 1897

Lewis, H. W. 1895

Navas, M. 1915

Brazil

Almeida, A. L. 1887

Braune, D. H. 1883

de Almeida, L. J. 1885

Lage, O. V. B. 1891

Porto, R. M. da 1877

Tinoco, L. A. F. 1893

Torelly, F. DaS. 1887

Central America

*Clark, W. O. 1874

West Indies

Ballou, H. A. 1895

Turner, H. W. 1909

ADDRESSES UNKNOWN

* Denotes Non-Graduates

1871

*Barrows, William, Jr.
*Bell, George H.
*Cole, Daniel P.
*Williams, Henry

1872

*Barreto, E. Fiuza
*Blood, Alonzo H.
*Codina, Gabriel
*Naito, Saitaro
*Nash, Arthur H.
*Penhallow, Charles L.

1873

Wood, Frank W.
*Bailey, Jonathan
*Colby, Daniel T.
*Cooke, Charles M.
*Damon, Edward C.
*Frisbie, George B.
*Furness, George A.
*Garrett, William E.
*Lovell, Frank K.
*Mines, William W.
*Rowland, Charles W.
*Smith, William O.

1874

*Ariail, Smith
*Doubleday, Henry M.
*Doubleday, William H.
*Duncan, George A.
*Johns, Arthur C.
*Mitchell, William H.
*Moody, George F.
*Ould, Remus
*Pearce, Walter S.
*Post, Dr. Henry W.
*Shaw, Charles J.
*Smith, John B.

1875

*Chase, Edmund T.
*Clark, Lysander
*Cowles, Elliot A.
*Ellis, Granville A.
*Graves, L. B.
*Lyon, William S.
*Newman, Charles V.
*Nomura, Ichiskay
*Player, Harry H.
*Sanger, Herbert C.
*Thomas, John L.
*Wright, Augustus H.
*Yamao, Tenataro
*Youchi, Geamon

1876

Bagley, David A.
Hawley, Joseph M.
Ladd, Thomas H.

Phelps, Charles H.
*Clark, Charles T.
*DePew, Richard M.
*Hadwen, William E.
*Merriam, J. H.
*Parker, Edward H.

1877

Brewer, Charles
Nye, George F.
*Bond, Henry
*Goodrich, Wilbur F.
*Moore, Frank L.
*Nakashima, Masanogio
*Paige, Harry C.

1878

*Allen, Matthew J.
*Collum, George N.
*Franco, Eugenio deL.
*Goss, Frank W.
*Walker, James B.

1879

*Camargo, H. P.
*Carey, Charles B.
*Knox, Reuben
*Palmer, Coddington B.
*Wadley, George D.

1880

Gladwin, Frederick E.
McQueen, Charles M.
*Goodale, E. T.
*Mattocks, Euao E.
*Pease, Charles T.
*Plaza, Enguerrando
*Stewart, William C.
*Warner, Dr. William E.

1881

*Bancore, Lewis
*Hawley, Amasa S.
*Kenfield, Charles R.
*Wolfe, Walter M.

1882

Taylor, Alfred H.
*Currier, George F.
*Delano, Julio J.
*Doyle, John J.
*Fish, Charles S.
*Harris, Richard B.
*Livermore, Nathaniel L.
*Perkins, Charles B.
*Porter, Royal L.
*Rhodes, William H.
*Smith, Herman K.
*Wilmarth, Dr. Frederick A.

1883

*Conger, Charles T.
*Smith, William E.
*Tryon, Charles O.

1884

Hermes, Charles
Smith, Llewellyn
*Smith, William R.

1885

*Brooks, Paul C. P.
*Cardoso, Peleusia
*March, Wilbur M.
*Putnam, George H.

1886

*Day, Robert C.
*Gaskill, Milo A.
*Kinney, Arno L.
*Lang, Dr. Charles J.

1887

*Stone, Fremont E.

1888

*Groeger, Gustavus

1889

*Adams, George A.
*Okami, Yoshiji
*Smith, James R.
*Waite, Herbert H.
*Wentworth, Elihu F.

1890

*Fellows, George S.
*Frost, William L.
*Goddard, George A.
*Hogan, Frederick W.
*Maynard, John B.
*Stillings, Dr. Levi C.
*Thayer, Bernard

1891

Horner, Louis F.
Johnson, Charles H.
*Palmer, Herbert W.
*Turnbull, Ernest H.

1892

Fletcher, William
*Chamberlain, Pierce A.
*Hoar, Thomas
*McDonald, Frederick J
*Saville, James R.
*Sedgwick, Benjamin
*Tyng, Charles
*Tyng, George M.

1893

Hawks, Ernest A.
 *Haskell, Ernest A.
 *Kellogg, John H.
 *Lane, William A.
 *Munro, David
 *Soule, George W.

1894

Sanderson, William E.
 *Bentley, Irving W.
 *Cook, Jay E.
 *Duffield, William C.
 *Ono, Saburo
 *Robbins, Dana W.

1895

Dickinson, Charles M.
 *Court, William B.
 *Davis, Alfred W.
 *Jones, John H.
 *Woodbury, Roger A.

1896

*Geary, Hiram G.

1897

*West, Harold L.

1899

*Chapman, John C.

1900

Lewis, James F.
 *Otis, Wilbur C.
 *Rogers, William B.

1901

Barry, John C.
 Dickerman, William C.
 Gamwell, Edward S.
 O valle, Julio
 Todd, John H.
 *Greeley, Dana S. B.
 *Gurney, Victor H.
 *Hemenway, Francis E.
 *Jones, Clark W.

1902

Bodfish, Henry L.
 Paul, Herbert A.
 *Chapin, Warren L.

*Chase, William J.
 *Greeman, Fred H.
 *James, Harold F.
 *James, Hubert C.

1903

Monahan, Neil F.
 Peebles, W. W.
 *Allen, Miss Lilly B.
 *Bowler, Patrick H.
 *Cheever, Herbert M.
 *Dillon, James H.
 *Higgins, Willis E.
 *Potter, Roland D.
 *Wollhein, Ernest

1904

Raymoth, R. Raymond
 *Collins, Joseph D.
 *Copeland, William W.
 *Cummings, John F.
 *Ellsworth, Frank L.
 *Graves, George A.
 *Ryan, Arthur
 *Sawin, Ralph D.
 *Smith, Walter A.

1905

*Belden, William L.
 *Brigham, Fred W.
 *Goodenough, Herbert H.
 *Knight, John H.
 *Ladd, Joseph, Jr.
 *Porter, Charles A.
 *Straw, Harold D.
 *Williams, Franklin K.

1906

*Prenn, Joseph
 *Spurr, Fred Y.
 *Stoddard, Calder S.
 *Sullivan, Patrick F.

1907

*Amsden, Eugene C.
 *Dudley, Fred S.
 *Finkelstein, David E.
 *French, Vida R.
 *Hanson, Stuart W.
 *Kalina, Jacob
 *Leighton, Carl
 *Raftt, John A.

1908

Waugh, Thomas F.
 *Allen, Herbert C.
 *Fullam, Charles F.
 *Negus, Philip H.
 *Pagliery, Jose C.
 *Wheeldon, Albert J.

1909

Sexton, George F.
 Shamiae, G. M.
 *Lyman, Arthur D.
 *O'Donnell, John F.
 *Parsons, Egbert R.
 *Pearce, Ernest E.
 *Trainor, Owen F.

1910

*Bartlett, Leslie C.
 *Chaffee, Alfred B.
 *Gould, Harold A.
 *Hastings, David B.
 *Hatch, William M.
 *Lipman, Isaac B.
 *McFarlane, George E.
 *Rockefeller, Harlan V.
 *Smith, Halliday S.
 *Sullivan, Arthur J.

1911

*Chadbourne, James G.
 *Hazen, Jacob
 *Hyatt, Herbert F.
 *Lew, Gerard N.
 *Liang, Ying Chi
 *McGann, P. S.
 *Moody, Chester
 *O'Connor, J. H.
 *Robinson, Sturgis M.
 *Wheeler, Ralph E.

1912

Hall, Henry B.
 *Durling, Edgar V.
 *Edwards, Clarence D.
 *Garelick, George
 *Lloyd, Edward R.
 *Maxon, Donald C.
 *McLeon, John R.
 *Turner, Austin R.

1914

*Cole, Herbert E.

THE F. A. BASSETTE CO. PRINTERS
SPRINGFIELD, MASS.



Where Are YOU
Going to
College

?

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MASSACHUSETTS AGRICULTURAL COLLEGE BULLETIN

AMHERST, MASS.

Volume VIII

Number 5

SEPTEMBER, 1916

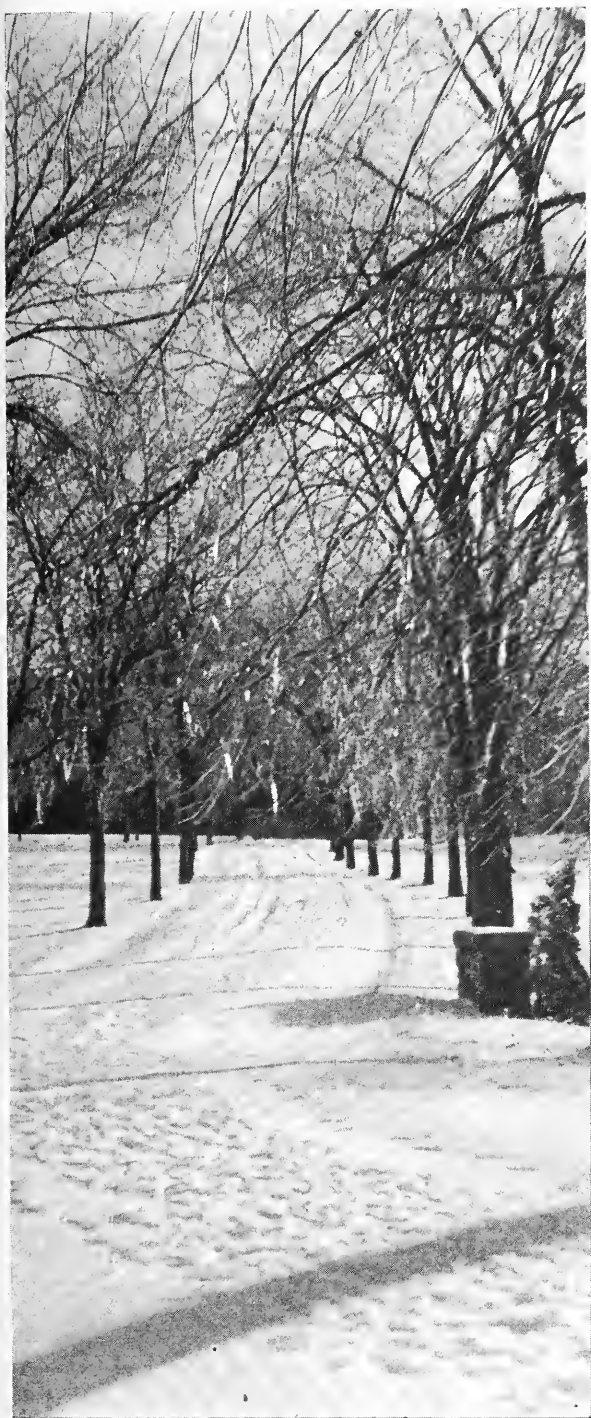
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THE DINING HALL

The
Massachusetts Agricultural College:

Offers a four-year course of study leading to the degree of Bachelor of Science.

Is open to men and women who have completed a four years' high school course, and who can satisfactorily meet the entrance requirements.

Is open to unclassified students not candidates for a degree.

Provides a general education, at the same time allowing specialized work in one of seventeen major departments.

Had a registration of 668 students in 1915-1916.

Has one of the most beautiful and attractive campuses of any college in America.

Possesses excellent equipment in the shape of buildings, laboratories, lecture rooms and apparatus.

Comprises over 600 acres in farm, orchards, campus and experimental grounds.

Is recognized in athletics and other inter-collegiate activities.

Charges no tuition to residents of the state. Expenses are moderate.

Provides courses of study in twenty-seven teaching departments.

Requires military drill and tactics apart from the prescribed course.

Is not suited to all men, and all men are not fitted for it.

Requires a high grade of scholarship.

Is *not* an agricultural trade school, but a *real* college.



THE CROSS WALK

Why Go to College?



THE statement has been made that the strength of our nation lies in the fact that every boy aspires to rise above the station of his father, and by virtue of our democratic opportunity is able to do so. But boys of college age are not in demand to-day in the industrial world in any position which gives them a *chance to grow*. To be sure they can tend spindles in a cotton mill, they can drive a grocery wagon, they can run an elevator. But these are not steps to advancement. "They are steps on a treadmill, not steps on a ladder. A boy may rise from them, but he cannot rise by them." Yet does it pay to send boys to college? Is the game worth the candle? Can you truthfully assent to that contemptuous notice placed by Horace Greeley in his newspaper office: "No college graduate or other horned cattle need apply"?

"An education is the safest investment; pays the highest interest; is the most readily converted into cash; never depreciates in value; never suffers from taxation; is never in danger from thieves; never ends in a lawsuit; is a gain for all eternity." A college training affords an opportunity, not only for the acquirement of knowledge, but also for the matching of that knowledge against real problems. Definite good



EAST EXPERIMENT STATION

is derived from new adjustments. A college man gets out of himself into the lives of others. The college brings together ideas and actions.

The values of a college training are varied, but enriching. A graduate from the Colorado School of Mines claims he got "a vision of life work instead of a job." Another from the University of Louisiana maintains that he was brought to "a realization that I was worth as much as the average man." A Boston University alumnus makes this statement; "When I entered I regarded it (college education) as a process of instilling facts in a young person's mind; when I graduated I knew this was a very small part, merely a means to an end,—the development of personality." From the University of Georgia comes this confession; "a self unfoldment, a diversity of interests in life, a growth of ideals, of purposes and of judgment; strong convictions and friendships."

True, a great deal may be said against a college education, but this fact remains that, "If a college man has used the opportunities offered by the faculty, he has acquired a wide knowledge of history and a broad view of public affairs. If he has utilized the opportunities offered by his fellow students, he has acquired the democratic spirit, has gotten a grip on public opinion, and has had considerable experience in dealing with a large variety of men. All these things



ON THE RIFLE RANGE

give him an advantage in the race, and statistics show that he is making good use of them.”

The Significance of An Agricultural Education

“The powers of the American college to develop individual initiative and leadership have been decidedly enhanced in recent years.” The characteristics of college courses are determined by two things; 1st the character of the man to be educated; 2nd by the kind of world in which the man is to live and work. There has arisen a special class of men ambitious for careers in connection with agriculture. The potentialities of agriculture are increasing; the opportunities are greater than ever, and the demand for men to serve in its varied and important fields is beyond the capacity of the agricultural colleges to supply. Hence, the modern agricultural college.

What am I best fitted for? Have you ever satisfactorily answered that question? Isn't it possible that you might find your forte in one of the several agricultural vocations? The Massachusetts Agricultural College furnishes excellent training in nearly all of the agricultural vocations. Do not be possessed with the idea that because a man goes to an agricultural college he is doomed to a life of corn-hoeing, weed-pulling and wood-sawing. The business of



SOCIAL UNION ROOM

farming and its underlying sciences make the agricultural business the greatest industry on earth. Specialists are demanded in every branch. The problems of food production; making the farm "pay"; farm business and management; advantageous buying and selling; economic problems; social and moral problems; engineering problems; educational problems, and the fields of scientific investigation demand brainy, alert and ambitious college men.

Opportunities in agriculture lie along the lines of practical farming, stock raising, dairying, poultry farming and farm management. Then, too, this college training fits men, who do not care for practical farming, for employment in government service, in other agricultural colleges and experiment stations, rural engineering and other agricultural lines.

The opportunities in horticulture are also large. Practical fruit growing, practical floriculture, landscape architecture, forestry and market-gardening offer exceptional opportunities. Teaching, research work and experimentation in these same subjects afford additional openings.

Particularly in the sciences the chance for teachers, research workers and experiment station men is large. Government and state positions as chemists, botanists, entomologists and bacteriologists are open to the well trained man.

It is gradually being realized that the economic and social side of the agricultural business must receive more attention. For men with the



A STUDENT'S ROOM

right bent and training the solution of these problems offers work in a real, practical and vital field.

The new field of rural journalism is beginning to afford promising opportunities for men with literary and editorial abilities. Rural journalism is the application of journalistic principles in getting and suitably presenting material adapted to the non-urban rather than to the urban or metropolitan reader. Developing the literary tastes and molding the opinions of the rural population is a most influential task of country editors.

Opportunities for men to teach in any phase of the work offered in the agricultural college are always plentiful. Men trained for extension service work, for farm bureau positions, and county advisors are in demand. Men with an inclination towards business professions have an ample field for devoting their talent to the application of business principles to agriculture.

The object of the course of study at the Massachusetts Agricultural College is to give a man a good general education, and at the same time allow him to specialize in any of the departments in which a major course is offered. Its graduates hold positions of trust and responsibility as practical farmers, fruit growers and landscape architects; as college presidents, experiment station directors, extension service directors, college professors and instructors; as teachers in colleges and high schools; as government scientists, investigators and experts.



SOUTH COLLEGE DORMITORY

The Money Value of a College Education

“Every farm boy has within his reach a college education. The acquirement of such an education will greatly increase the value of the young man as a citizen, as a business man, as a leader. He may farm successfully without such education, but he will farm more successfully with an education in a college of agriculture than without it.

“Farm boys who are looking forward to work as teachers of agriculture, investigation, county agricultural agents, service in the United States Department of Agriculture, or similar positions must have a good training in a college of agriculture. The demand for well trained men of ability is greater than the supply.

“It is a most serious and fundamental mistake for a young man to regard the time spent in careful preparation and training as wasted time. Money invested in thorough preparation and earnest training will yield a larger income on the investment than a similar sum in land, farm machinery or live stock. All farm management surveys show that the educated farmer has a larger income and a better living. At the Missouri experiment station an investigation of the incomes of 554 farmers showed that the educated farmer's income was 71.4 per cent larger than that of the untrained farmer. Preparedness is a good motto for the farm boy.”



THE TROPHY ROOM

“An investigation conducted by the United States Department of Agriculture shows that the labor income of farmers having a college education is \$495 per year greater than that of farmers having only a common school education. In 40 years the college education would increase the normal earning power of the farmer by $40 \times \$495 = \$19,800$. In other words each of the eight years in high school and college is worth \$2475 to the farmer.”

“One large State institution gives the average income of the graduates of its agricultural department, five years out, as \$2028. Another institution, concerning the salaries of its agricultural graduates, says that those who have been out two to three years receive \$1450, four to seven years \$1800, eight to fifteen years \$2250, sixteen to thirty-seven years \$3300.”

Requirements for Admission

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from the secondary school will be accepted.

The applicant for admission must be at least sixteen years old, and must present to the Registrar proper testimonials of good character.

All application blanks for admission either by examination or certificate may be obtained from the registrar. Blank form for certification are sent to school *principals or superintendents only*.

Certificates will be received from those schools of New England which have been ap-



ON THE FARM

proved by the New England College Entrance Certificate Board.

Credentials of the Board of Regents of the State of New York are accepted.

Fourteen units must be offered for admission. The term unit means the equivalent of at least four recitations a week per school year.

Certificates to be accepted must present at least three of the necessary fourteen credits.

Subjects lacking on examination (except for the permitted number of conditions) must be made up at the time of the examination for admission. Conditions to the amount of two units will be allowed.

Unclassified Students

1. No entrance examinations required, but applicants must furnish certificates showing that they have completed a four years' high school course or its equivalent.

2. No applicant under twenty-one years of age will be admitted as an unclassified student.

3. Every unclassified student must do all the work of the courses elected, and take all examinations therein; must attain a grade of at least 75%; must pass in at least two-thirds of his work or he will be dropped from college.

Note: These regulations are subject to revision.

Why Not Be a Leader?

The term "college man" generally connotes an individual of broad education and thorough training. A college training brings with it responsibility. That responsibility assumes some form of leadership. It is a leadership that comes to the man of advanced knowledge and superior advantages, who sees the needs of his time and his community, and who exerts himself in behalf of those needs. Every college man by virtue of the advantages he is enjoying is expected to be a leader, regardless of what college he attends or what profession he enters or what community he settles in. The fact that people know him to be a college man stamps him as a person who is expected to produce results.

The college man has been accused of being impracticable, that he is a dreamer of dreams and not a doer of deeds, that he has no position in the strenuous competition of life to-day. Yet it is of the college man that things are expected. In all trades and professions of life, in all enterprises of organization, in managerial positions, in public office, and in institutions of public service the trained man is demanded. You should regard your prospective college education as a stepping stone to a dominant leadership.

Why not prepare yourself to assume a command in rural affairs? Rural progress is checked for the lack of trained leaders? The broadening of country life, its growing complexities and rising standards are creating problems beyond the reach of untrained leaders. "Well trained doctors, ministers, teachers, et cetera, have a great chance to-day in the country, because their *training* finds unique appreciation for its very rarity and efficiency; while every profession is foolishly overcrowded in the cities."



A Public Service Institution

The Massachusetts Agricultural College

trains men for agricultural vocations and for leadership, not only in their vocational pursuits, but also in other activities of life. To accomplish these ends, the College offers instruction in Agriculture, Horticulture, the Sciences, the Humanities and Rural Social Science. A student is required to take certain prescribed courses designed to insure him a general education; he may then specialize in any one of the following subjects:

<i>Agriculture,</i>	<i>Pomology,</i>
<i>Agronomy,</i>	<i>Economic Botany,</i>
<i>Animal Husbandry,</i>	<i>Agricultural Chemistry,</i>
<i>Dairying,</i>	<i>Economic Entomology,</i>
<i>Poultry Husbandry,</i>	<i>Microbiology,</i>
<i>Floriculture,</i>	<i>Rural Journalism,</i>
<i>Forestry,</i>	<i>Agricultural Economics,</i>
<i>Landscape Gardening,</i>	<i>Agricultural Education,</i>
<i>Rural Social Science</i>	

The Graduate School presents an opportunity for advanced study in many of the subjects enumerated above.

The demand for men trained at the Agricultural College is constantly increasing, and the vocational opportunities offered to these men are attractive.

Tuition is free to residents of Massachusetts, and the expenses are moderate. There are opportunities for the more needy students to earn a portion of their expenses.

Are you interested in this institution which trains men for effective service in a field of endeavor not yet overcrowded?

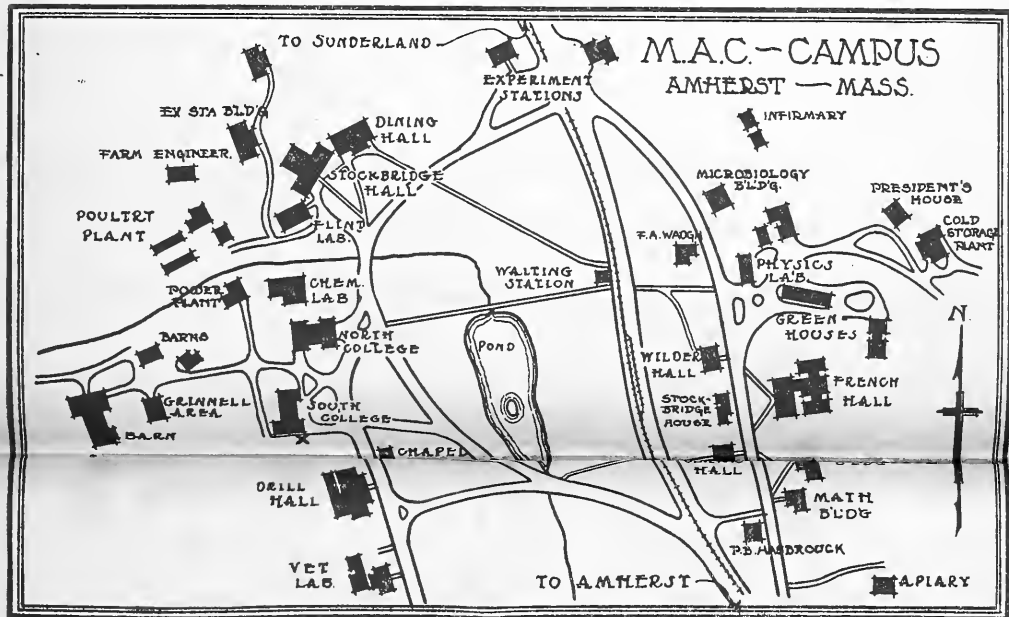
A catalog will be sent on application.

RALPH J. WATTS,

Secretary,

Amherst, Mass.

September, 1916.



MASSACHUSETTS AGRICULTURAL COLLEGE

Please send complete catalogue of the College to the following address:

Name _____

Street _____

High School or Academy _____

City or Town _____

State _____

Class _____





THE MASSACHUSETTS AGRICULTURAL COLLEGE

Short Course Announcement

No. 6 *Entered as second class matter at the Post Office, Amherst, Mass.* **October, 1916**

WINTER SCHOOLS

1916-17



Amherst, Massachusetts

Published six times a year at Amherst, Mass., by the Massachusetts Agricultural College

WINTER SCHOOLS

1916=1917

SHORT COURSE ANNOUNCEMENT

Number 6

October, 1916

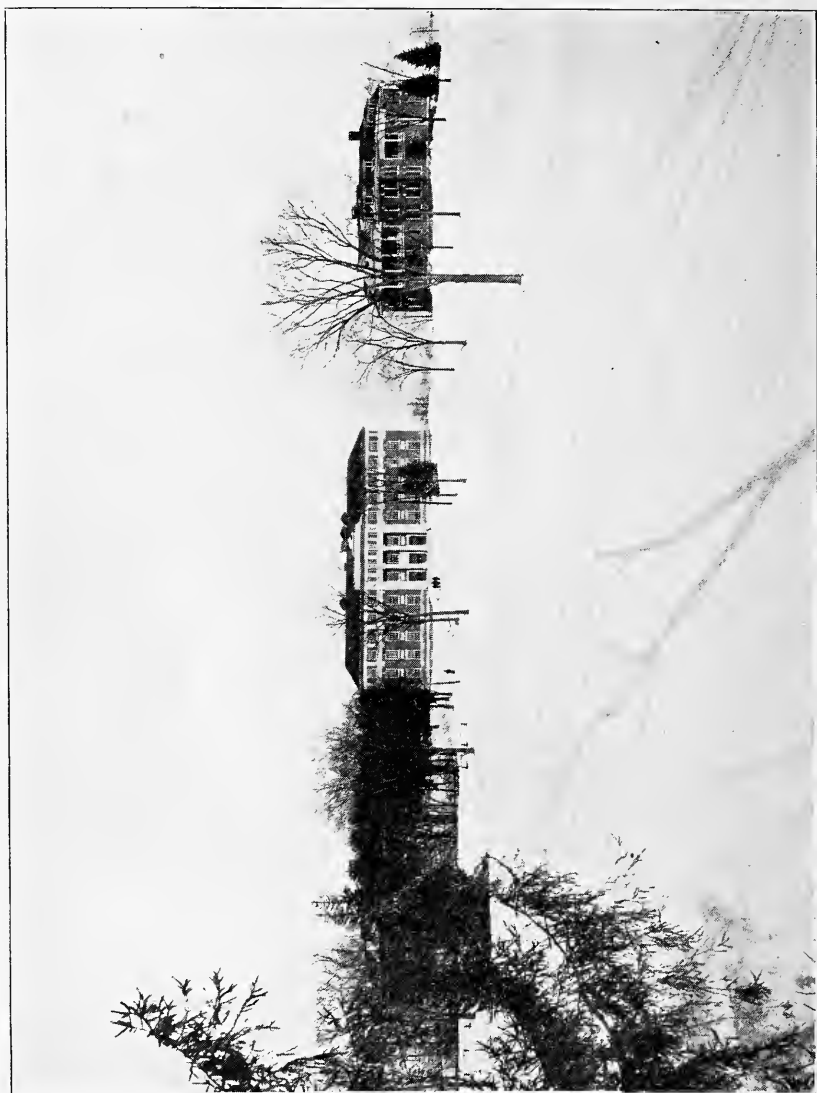
also

M. A. C. BULLETIN

Volume VIII

Number 6

Published by
THE MASSACHUSETTS AGRICULTURAL COLLEGE
AMHERST, MASS.



WINTER VIEW SHOWING SOME OF THE COLLEGE BUILDINGS

THE SHORT COURSES

The Short Courses include all the courses which are given at the College, other than those which are included in the regular college schedule and the schedule of graduate work. They vary in length from one to twelve weeks and are open to both men and women.

This bulletin deals primarily with the main winter short course, designated as the Twelve Weeks' Course, but the other winter short courses are described herein and the summer courses are mentioned.

At the present time agricultural instruction throughout the country is undergoing rapid changes in administration. The line dividing Short Course work and Extension work has not as yet been sharply drawn and certain phases of instruction are now included under each head which may later be classified differently.

SHORT COURSES 1916-1917

Winter Schools

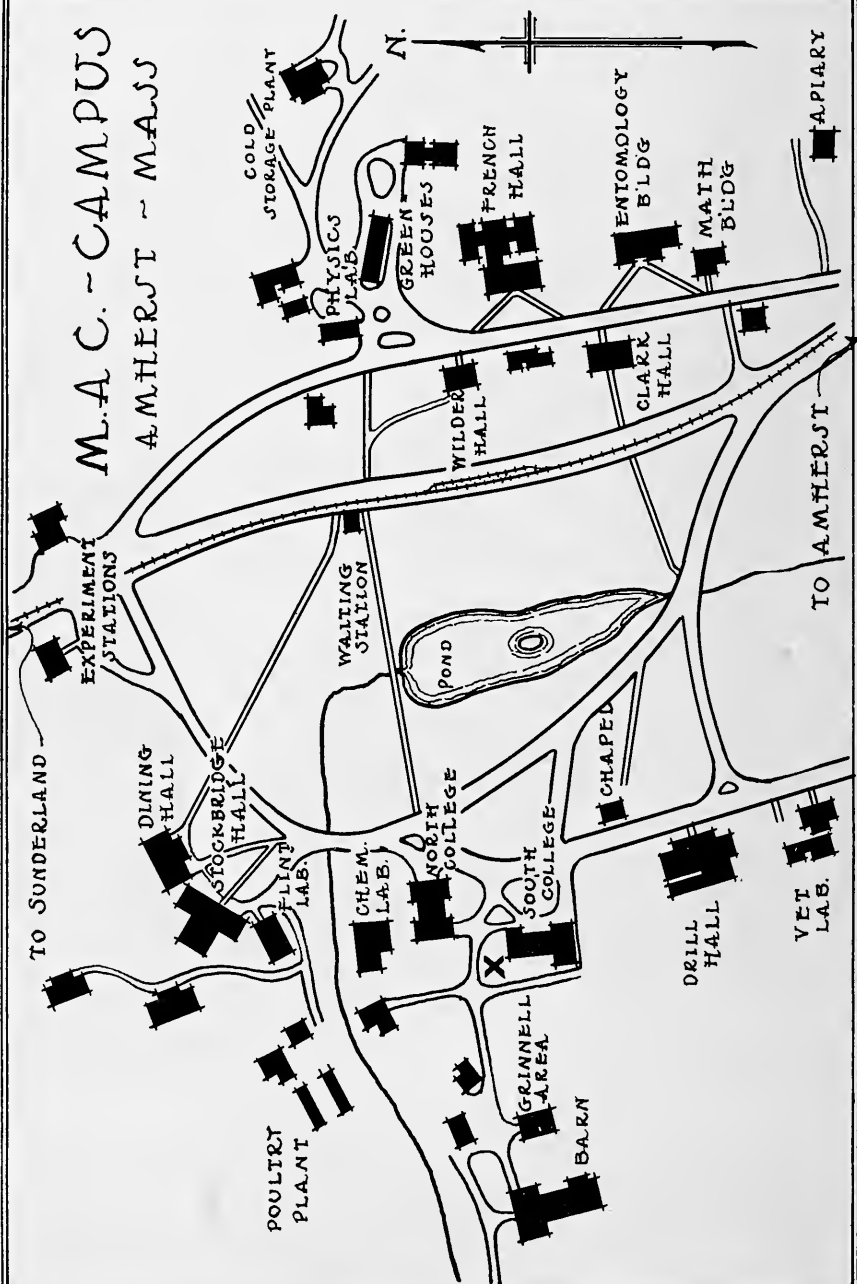
Apple Packing School	Oct. 3 to 7, (inc.)	1916
Twelve Weeks' Courses	Jan. 1 to Mar. 23, (inc.)	1917
Farmers' Week	Mar. 26 to 30, (inc.)	
Annual Beekeepers' Convention	Mar. 27 to 29, (inc.)	
Polish Farmers' Day	Mar. 22	
School for Beekeepers.	Date and place to be announced	

Summer Schools

Summer School of Agriculture and Country Life	July 2 to 31, (inc.)	1917
School for Rural Social Service	During July	
School for Library Workers	July 16 to 28, (inc.)	
Poultry Convention	July 25, 26 and 27	
Boys' and Girls' Agricultural Camps	During July	
Conference on Rural Organization	Dates to be announced	

M.A.C. - CAMPUS

AMHERST - MASS



THE TWELVE WEEKS' COURSES

Jan. 1 to Mar. 23, (inc.) 1917

Announcement



THE Twelve Weeks' Courses at the Massachusetts Agricultural College are offered to meet the needs of those, both young and old, who desire to study principles and modern methods of agriculture and who for various reasons are unable to attend the four year courses. The work is planned to bring before the student the results of the latest investigations in agricultural science, and to point out their practical application. Twelve weeks being a comparatively short period of time, the courses are necessarily exceedingly concentrated and practical and are therefore attractive and valuable to the farmer or the prospective farmer regardless of what his training may have been or how extensive his previous education.

The instruction is given largely by the regular faculty of the college by means of lectures, recitations, laboratory exercises, and practical work; assistance is given from time to time by nonresident lecturers on special subjects. The work in the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. The library of over 50,000 carefully selected volumes offers exceptional opportunities for special study in agriculture, horticulture, and related sciences.

The recent completion of a number of new agricultural buildings, with their modern laboratories, classrooms and other equipment, means much for the students in the Twelve Weeks' Courses. There is now ample provision for both the work of regular students and winter school classes.

Students will be required to elect courses to make not more than twenty-four nor less than twelve exercises each week. The arrangement of courses is such that students must follow certain lines of work. Those electing Field Crops, Market Gardening, Floriculture or Fruit Growing, must also take courses in allied subjects, as noted in the description of these courses. In general agriculture more latitude is allowed, but it is expected that students will show a definite purpose in the selection of work. All elections, as well as any deviation from the regular rule, must be approved by the Supervisor.

FACULTY OF THE TWELVE WEEKS' COURSES 1917

KENYON L. BUTTERFIELD, A.M., LL.D.

President of the College

WILLIAM D. HURD, M.AGR.

Director of the Extension Service and Supervisor of Short Courses

EARNEST D. WAID, B.SC.AGR.

Assistant Director of the Extension Service

PAUL J. ANDERSON, PH.D. Associate Professor of Botany.	<i>Botany</i>
JOHN L. BYARD Superintendent of the Apiary.	<i>Beekeeping</i>
ALEXANDER E. CANCE, PH.D. Professor of Agricultural Economics.	<i>Agricultural Economics</i>
WILLIAM D. CLARK, A.B., M.F. Professor of Forestry.	<i>Forestry</i>
SAMUEL COONS Instructor in Dairying.	<i>Dairying</i>
E. FARNHAM DAMON, B.SC. Extension Associate Professor of Agricultural Economics	<i>Agricultural Economics</i>
HARRY D. DRAIN, B.SC. Instructor in Dairying.	<i>Dairying</i>
BURTON N. GATES, PH.D. Associate Professor of Beekeeping.	<i>Beekeeping</i>
JOHN C. GRAHAM, B.SC. AGR. Professor of Poultry Husbandry.	<i>Poultry Husbandry</i>
CHRISTIAN I. GUNNESS, B.SC. Professor of Rural Engineering.	<i>Rural Engineering</i>
ARTHUR K. HARRISON Assistant Professor of Landscape Gardening.	<i>Landscape Gardening</i>
_____ Professor of Agronomy.	<i>Soil Fertility</i>

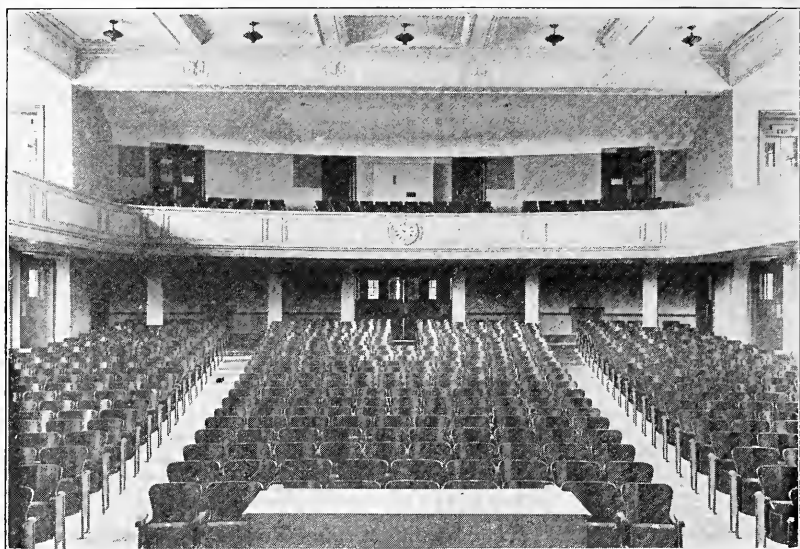
ORVILLE A. JAMISON, M.Sc. Assistant Professor of Dairying.	<i>Dairying</i>
EARLE JONES, M.Sc. Assistant Professor of Agronomy.	<i>Field Crops</i>
WILLIAM P. B. LOCKWOOD, M.Sc. Professor of Dairying.	<i>Dairying</i>
CHARLES E. MARSHALL, PH.D. Professor of Microbiology.	<i>Microbiology</i>
JOHN C. MCNUTT, B.Sc.Agr. Professor of Animal Husbandry.	<i>Animal Husbandry</i>
ARNO H. NEHRLING Associate Professor of Floriculture.	<i>Floriculture</i>
JAMES B. PAIGE, B.Sc., D.V.S. Professor of Veterinary Science.	<i>Veterinary Science</i>
LOYAL F. PAYNE, B.Sc. Assistant Professor of Poultry Husbandry.	<i>Poultry Husbandry</i>
WALTER M. PEACOCK, M.Sc.Agr. Instructor in Farm Administration	<i>Farm Management</i>
ELVIN L. QUAIFE, B.Sc.AGR. Assistant Professor of Animal Husbandry.	<i>Animal Husbandry</i>
WILLIAM S. REGAN, PH.D. Instructor in Entomology.	<i>Entomology</i>
FRED C. SEARS, M.Sc. Professor of Pomology.	<i>Fruit Growing</i>
ANDREW S. THOMSON, A.M. Assistant Professor of Market Gardening.	<i>Market Gardening</i>
FRANK A. WAUGH, M.Sc. Professor of Landscape Gardening.	<i>Landscape Gardening</i>
CARRICK E. WILDON, B.Sc. Graduate Assistant in Floriculture.	<i>Floriculture</i>

CHARLES R. GREEN, B.AGR.

Librarian of the College

Committee on Special Events

PROFESSORS WAID, THOMSON AND MCNUTT



AUDITORIUM

COURSES OF INSTRUCTION

A. Agricultural Group

1. Soil Fertility

The nature of soils, their chemical and physical properties; tillage; green manuring; crop rotation; drainage; stable manures, their value, composition, preservation, and application; commercial fertilizers, their nature and use; limes and liming; the improvement of "run-down" land. Three lectures a week.

2. Field Crops

Professor Jones

The production of field crops for New England; species and varieties, agricultural characteristics, methods of culture, rotations, harvesting and curing. The laboratory work gives the student practice in seed selection and testing for quality, purity, and germination, and in corn and potato judging. Course 1 required. Two lectures and one two-hour laboratory period a week.

3. Types and Breeds of Livestock

Professor McNutt

Outlines of the market classes and grades of beef cattle, horses, sheep and swine, placing emphasis upon the character-



istics of each class and its adaptations. The characteristics, the adaptations, and so far as is possible the historic development of each of the more important breeds of livestock are also carefully studied, as well as their distribution in America. Special

emphasis is laid upon dairy cattle and horses in the judging work. Three lectures and two two-hour judging periods a week.

4. Livestock Feeding

Professor Quaife

A study of the physiology of nutrition, the composition of feedstuffs, and of rational economic feeding. The feeding of dairy cattle and their management for profitable milk production receive first attention. Similarly, the feeding of horses, of beef cattle, of sheep and of swine, are studied. Three lectures a week.

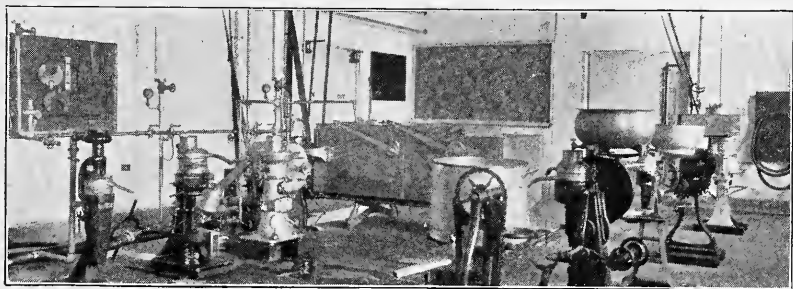
5. Animal Breeding

Professor McNutt

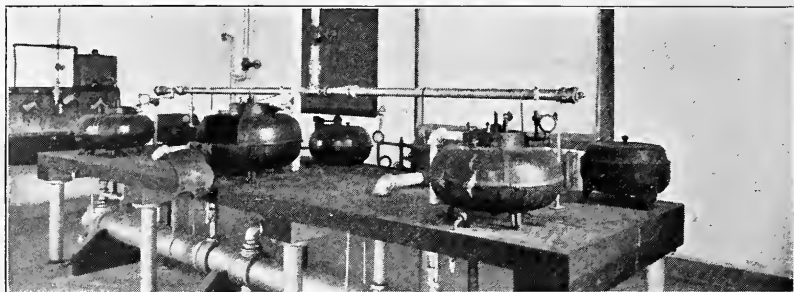
A discussion of the more common problems pertaining to the breeding of livestock, their explanation and solution; in-breeding; cross-breeding; grading. The work of the most successful men in history is studied. Time is given to the study of pedigrees of the different breeds of dairy cattle and other stock. One lecture and one two-hour laboratory period a week.

6. Dairying *Professors Lockwood and Jamison. Mr. Coons and Mr. Drain*

Babcock and acid tests; market milk handling; creaming methods; ripening cream and butter making; dairy arithmetic; dairy buildings, lighting, ventilation and sanitation. Five lectures and one one-hour, two two-hour and two three-hour laboratory periods a week.



SEPARATOR ROOM



BABCOCK TEST LABORATORY

7. Dairy Bacteriology

Professor Marshall

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization, pasteurization, control of fermentation, and the production of the best quality of market milk. Two lectures and one two-hour laboratory period a week.

8. Animal Diseases and Stable Sanitation

Professor Paige

Lectures upon some of the common diseases of livestock, giving special attention to methods of prevention, care, and sanitation; the treatment of emergencies and accidents; how to keep animals healthy. Two lectures a week.

9. Poultry Husbandry

Professors Graham and Payne

The course consists of lectures on poultry house construction, winter egg production, incubation and brooding, feeds and feeding and marketing poultry and eggs. There are also one or two demonstration periods per week, depending upon the size of the class. Demonstrations or practical work in killing, picking, caponizing, sorting and packing eggs for market, judging fowls for egg production, studying types, and studying construction of incubators and brooders. Our equipment enables us to demonstrate various methods in housing and feeding. Practical work in running incubators is given to as many as can be accommodated. Class limited to 80. Five lectures and one two-hour laboratory period a week.

10. Farm Management

Mr. Peacock

A study of some of the problems of modern farming and the factors that influence success, such as the choice of a region

and of a farm, types of farming, size of farm, rotation of crops, and labor problems. Two lectures a week.

11. Farm Accounts

Mr. Peacock

Actual practice in the use of a simple system of farm accounting, including cost accounts suitable for the large or the small farm. Two two-hour laboratory periods a week.

B. Horticultural Group

12. Fruit Growing

Professor Sears

This course deals with the practical side of the growing and marketing of fruits. Especial attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing. Lectures, supplemented by demonstrations, and whenever possible, actual work by the student. Students electing Fruit Growing are also required to take Course 1, and it is recommended that they take Courses 18 and 19. Three lectures and one two-hour laboratory period a week.

13. Market Gardening

Professor A. S. Thomson

This course is designed to acquaint the student with the business of market gardening as conducted in New England. It will consist of lectures, textbook assignments and laboratory exercises. The course will be divided into three principal groups: (A) the characteristics of the market gardening business from the standpoints of capital required, location, markets, site, area, soils and other fundamentals; (B) the application of general agricultural principles to the market gardening business; and (C) market garden crops in detail, with systems of production, in so far as the time will allow. Class limited to 30. Students electing market gardening are required to take Course 1, and it is recommended that they take Courses 18, 19 and 20. Three lectures and two two-hour laboratory periods a week.

14. Landscape Gardening

Professor Harrison

The general principles of the art; the various styles of design; the literature of landscape gardening; some notice of important American masterpieces; elementary problems in drafting and designing; plants, methods of construction, and planting. Class limited to 15. Two two-hour periods a week.

15. Rural Improvement

Professor Waugh

Civic art as applied to rural conditions; the improvement of roads, street trees, schoolhouses and grounds, public buildings; farm buildings, farm planning, etc.; the organization and

management of village and country improvement societies. This course given only if elected by ten or more persons. Two lectures a week.

16. Floriculture

Professor Nehrling and Mr. Wildon

This course is designed to furnish those who have not the time to devote to a longer course with the theoretical and practical considerations essential to success in floricultural work. The course covers as thoroughly as time will permit those aspects of the work of especial interest to a commercial florist. Some of the topics considered are greenhouse construction, greenhouse management, and methods used by the progressive florist. Special trips to some of the up-to-date floricultural establishments in the State are arranged. In addition to the regular lecture work, lectures are usually given by experts in the growing and marketing of special crops such as roses, carnations, violets and orchids. Course limited to 15 students and to those who are interested in commercial floriculture. Students electing this course will also be obliged to take Courses 1, 18 and 19. Five lectures a week; field trips on Saturday.

17. Forestry

Professor Clark

This course consists of a series of illustrated lectures on forest and woodlot management; the planting and care of forest and shade trees. Two lectures a week.

C. Related Sciences

18. Botany

Professor P. J. Anderson

A study of the structure, functions and diseases of greenhouse, garden, orchard and field crops, together with methods of disease prevention, including spraying and the application of fungicides. Two lectures a week.

19. Entomology

Dr. Regan

A study of the insects causing most injury to farm, orchard, garden and greenhouse crops, and to domestic animals, with methods for their destruction or control. Closely correlated with the work in horticulture and agriculture. Three lectures a week.

20. Beekeeping

Professor Gales and Mr. Byard

This course deals with fundamental and practical apiculture and its relation to horticulture (field and greenhouse market gardening, cranberry culture, fruit raising). The following subjects are included: the natural history and behavior of bees; their handling and manipulation; races; use of queens; wintering; comb and extracted honey production; the care of honey crops; diseases and their treatment; a thorough

study of appliances. First hand experience in all possible phases of the subject is emphasized. A large collection of implements affords excellent opportunity for demonstration. Two lectures and one two-hour laboratory period a week.

The course will be concluded by the Annual Beekeepers' Convention during Farmers' Week, which prominent authorities will attend. (See also School for Beekeepers, page 23.)

21. Farm Mechanics

Professor Gunness

Study of tillage, seeding and harvesting machinery; steam and gas engines; practice given in babbitting and fitting bearings, lining shafts and pulleys, lacing belts and packing valves; use of concrete for floors, walks, foundations, tanks and posts. One lecture and two two-hour laboratory periods a week.

22. Rural Sanitary Science

Professor Marshall

The following subjects are considered: significance of sanitary science; theories of disease; dirt and its dangers; drinking water and its protection; sewage, methods of disposal and purification; ventilation; foods; flies and mosquitoes in relation to sanitation; disinfectants, etc. Two lectures a week.

23. Problems of Marketing and Distribution *Professors Cance and Damon*

A discussion of some of the practical problems confronting the farmer in the disposal of his products and the purchase of his supplies, with suggestions for remedies; characteristics of the agricultural market; direct sales versus the commission man system; the necessity of standardizing and grading products; the method of organizing for the purposes of producing, buying and selling. Two lectures a week.



TWELVE WEEKS' COURSES—1917

		MORNING HOURS				AFTERNOON HOURS			
7:30	8:00—9:00	9:00—10:00	10:00—11:00	11:00—12:00	1:00—2:00	2:00—3:00	3:00—4:00	4:00—5:00	
MONDAY	SOILS	FEEDING ENTOMOLOGY	MARK. GARD. FRUIT GROW. But. Mak. 1 & 2 Market Milk 3 Babcock 5 & 6	FLORICULT. POULTRY But. Mak. 1 & 2 Market Milk 3 Babcock 5 & 6	Farm Accounts But. Mak. 1 & 2 Types & Breeds 2 Market Gard.	Dairy Arith. 1, 2, 3 Farm Accounts Types & Breeds 2 Market Gard.	DAIRY RU. SAN. SCI. FORESTRY	TYPES & BREEDS	
TUESDAY	FIELD CROPS RUR. IMPR.	DAIRY BACT. MARK. & DIST.	BEEKEEPING But. Mak. 1 & 2 Market Milk 4 Farm Mech. 1	FLORICULT. AN. DISEASES POULTRY But. Mak. 1 & 2 Market Milk 4 Farm Mech. 1	Beekeeping But. Mak. 1 & 2 Fruit Group. 1 An. Breeding 1 FARM MECH.	Beekeeping Fruit Grouping 1 An. Breeding 1	DAIRY BOTANY	FARM MANAGE.	
WEDNESDAY	SOILS	FEEDING ENTOMOLOGY	MARK. GARD. FRUIT GROW. But. Mak. 3 & 4 Market Milk 5 Babcock 1 & 2	FLORICULT. POULTRY But. Mak. 3 & 4 Market Milk 5 Babcock 1 & 2	But. Mak. 3 & 4	ASSEMBLY	DAIRY Land. Gard.	Farm Mech. 2 TYPES & BREEDS Land. Gard.	
THURSDAY	FIELD CROPS RUR. IMPR.	DAIRY BACT. MARK. & DIST.	BEEKEEPING But. Mak. 3 & 4 Market Milk 6	FLORICULT. AN. DISEASES POULTRY But. Mak. 3 & 4 Market Milk 6	Poultry 1 But. Mak. 3 & 4 Fruit Group. 2 An. Breeding 2	Poultry 1 Fruit Group. 2 An. Breeding 2	DAIRY BOTANY	AN. BREEDING	
FRIDAY	SOILS	FEEDING ENTOMOLOGY	MARK. GARD. FRUIT GROW. But. Mak. 5 & 6 Market Milk 1 Babcock 3 & 4	FLORICULT. POULTRY But. Mak. 5 & 6 Market Milk 1 Babcock 3 & 4	But. Mak. 5 & 6 Types & Breeds 1 Market Gard.	Dairy Arith. 4, 5, 6 Types & Breeds 1 Market Gard.	Farm Mech. 1 DAIRY RU. SAN. SCI. FORESTRY	Farm Mech. 1 TYPES & BREEDS	
SATURDAY	Farm Accounts Types & Breeds 1 Field Crops 1 Land. Gard.	Farm Accounts Types & Breeds 1 Field Crops 1 Land. Gard.	Floriculture But. Mak. 5 & 6 Market Milk 2 Poultry 2 Farm Mech. 2	Floriculture But. Mak. 5 & 6 Market Milk 2 Poultry 2 Farm Mech. 2	Floriculture But. Mak. 5 & 6 Types & Breeds 2 Field Crops 2	Floriculture Types & Breeds 2 Field Crops 2	Floriculture	Floriculture	

Italics indicate Laboratory Periods.
Types and Breeds 1 same men as Dairying 1-2-3
Types and Breeds 2 same men as Dairying 4-5-6
Poultry Laboratory Sections 3 and 4 by arrangement.

THE MASSACHUSETTS AGRICULTURAL COLLEGE

TWELVE WEEKS' COURSES

Application Blank

I hereby make application for admission to the Twelve Weeks' Courses which are to begin January 1, 1917. I am enclosing the registration fee of five dollars (\$5.00) in cash, check or money order. (Designate which one)

Name (Mr., Mrs., or Miss).....

Date of Birth.....Date of Application.....

Street Address.....Post Office.....

State.....Present Occupation.....

Previous Education.....

Reference (name and address).....

Name and address of person to notify in case of illness or accident.....

After consulting the schedule on page 14, place an X before each course you wish to take. Send this blank to the Supervisor.

GROUP A

Course	Hours
1. Soil Fertility	3
2. Field Crops	3
3. Types and Breeds of Livestock	5
4. Livestock Feeding	3
5. Animal Breeding	2
6. Dairying	10
7. Dairy Bacteriology	3
8. Animal Diseases and Stable Sanitation	2
9. Poultry Husbandry	6
10. Farm Management	2
11. Farm Accounts	2

GROUP B

Course	Hours
12. Fruit Growing	4
13. Market Gardening	5
14. Landscape Gardening	2
15. Rural Improvement	2
16. Floriculture	5
17. Forestry	2

GROUP C

Course	Hours
18. Botany	2
19. Entomology	3
20. Beekeeping	3
21. Farm Mechanics	3
22. Rural Sanitary Science	2
23. Marketing and Distribution	2

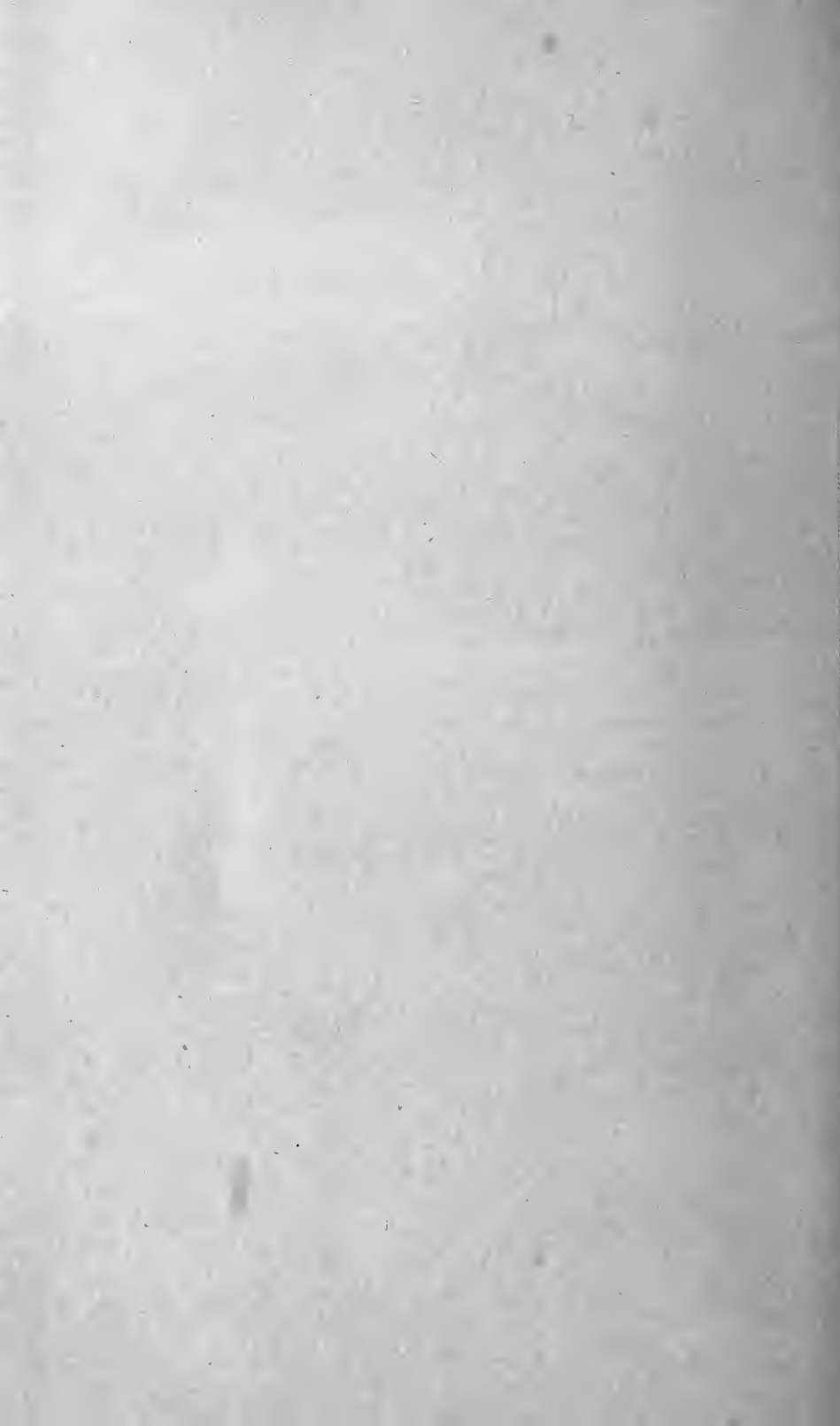
Note that the grouping and the schedule allow the following of definite lines of study. Soil fertility may be combined with any of the several subjects in groups A, B and C. Those who plan to specialize in dairy work will find it possible to take soil fertility and field crops and the majority of the animal husbandry and dairy courses. Those desiring to combine poultry husbandry with fruit growing or market gardening may arrange a very good schedule including related subjects. The majority of courses in group C can be taken in connection with a definite line of study based upon the courses in groups A and B.

NOTE.—Registration fee must accompany this application. Make check or money order payable to The Massachusetts Agricultural College.

Fee.....

Date Received.....

Reference.....



REQUIREMENTS FOR ADMISSION



WINTER VIEW ON CAMPUS

No entrance examinations are required, but students are advised to review their school work in English and arithmetic before entering. Practical experience in farm, garden, orchard, or greenhouse work is an advantage. The courses are open to both men and women.

Students must be at least 18 years of age, and must furnish satisfactory evidence of good moral character. References are required and these are investigated before applicants are accepted.

Application for admission should be made as early as possible by filling out the blank on Page 15 of this bulletin. It is sometimes necessary, when the registration becomes too large, to

limit the numbers in certain courses. In limited courses, students are accepted in the order of registration as shown by date on application blank.

Those who are late in entering are admitted only on consent of the instructors in the courses desired.

Students should report to the Supervisor on Monday, January 1, in order to begin work promptly on the morning of January 2.

REPORTS

At the close of the school all students will receive a formal report showing their standings in all courses in which they were registered.

EXPENSES AND OTHER INFORMATION

A registration fee of \$5 is charged those who take the Twelve Weeks' Courses. This fee is payable upon presentation of the application blank.

Living expenses in connection with the courses are about as follows:

Furnished rooms in private families	.	.	.	\$1.50-\$3.00 per week
Board at college dining hall	.	.	.	(about) \$4.50 per week
Board in private families	.	.	.	\$5.00-6.00 per week

A lunch counter is operated in connection with the college dining hall, at which meals may be secured a la carte at very reasonable prices. There are also several restaurants in the village which offer very reasonable rates.

Students in each of the dairy courses must provide themselves with two white wash suits, and a white cap for use in the practical dairy work. The cost in Amherst is about \$1.35 for suit and cap.

Text books are required in certain courses, and their purchase is recommended in others. The cost of this item should not exceed an average of \$5.00.

A list of available rooms is furnished at registration time and every effort will be made to see that all who come are comfortably located.

A SUGGESTION TO NEW STUDENTS

The college is anxious that Winter School students derive as much benefit as possible during their stay at the college. The suggestion is here made, therefore, that those students who have had little or no experience in practical agriculture as well as those who wish to better inform themselves on the subjects in which their chief interest lies, do some systematic reading on those subjects previous to coming to the college to take up the work.

"Elements of Agriculture," by Warren, published by the Macmillan Company, is suggested as a general book covering agriculture and horticulture in their various phases. This book contains chapters upon the various specialties.

For those who care to go still further in preliminary reading the following books are suggested:

Course 1, "First Principles of Soil Fertility," Vivian; Course 3, "Types and Breeds of Farm Animals," Plumb; Course 4, "Feeds and Feeding," Henry; Course 6, "Milk and its Products," Wing; Course 7, "Bacteria in Milk," Conn; Course 9, "Productive Poultry Husbandry," Lewis; Course 12, "Principles of Fruit Growing," Bailey; Course 15, "Rural Improvement," Waugh; Course 16, "Principles of Floriculture," White; Course 17, "New England Trees in Winter," Blakeslee & Jarvis; Course 18, "Practical Botany," Bergen & Caldwell; Course 19, "Elementary Entomology," Sanderson & Jackson; Course 21, "Farm Machinery and Farm Motors," Davidson & Chase; Course 23, "Rural Economics," Carver, and also an article on "Community Organization" by Carver in the United States Department of Agriculture Yearbook for 1914.

These books may be obtained from publishers or from the Johnson Book Company, Amherst, Mass.

RULES AND REGULATIONS

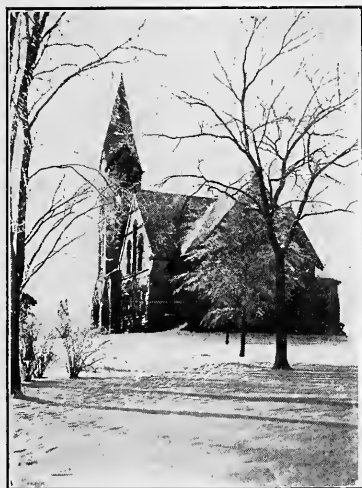
Those who attend the short courses are expected to conduct themselves in a manner that will conform to the usages of good society.

As a guide to those who come to the college for the first time the following extracts are taken from the regular rules of the college:

"The customary high standard of college men in honor, manliness, self-respect, and consideration for the rights of others, constitute the standards of student deportment.

"It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution."

CHAPEL AND ASSEMBLY



Previous to last year the limited seating capacity of the Chapel precluded the attendance of Winter School students at morning Chapel and Wednesday Assembly. The new auditorium in Stockbridge Hall, seating one thousand people, now permits their attendance at the regular exercises. All Twelve Weeks' Course students, therefore, will be required to attend morning Chapel on Monday and Friday at 7:30, and on Sunday at 9:00, and mid-week Assembly at 2:00 on Wednesday. These gatherings are all held in the auditorium in Stockbridge Hall.

ORGANIZATIONS

During the past several years winter course students have maintained an organization for social, recreative, and study

purposes. This organization has met each week during the course.

The Stockbridge Club is a student organization which holds meetings every week for the discussion of agricultural and horticultural subjects. Its meetings are often addressed by well-known specialists. Membership is open to students in the Twelve Weeks' Courses.

The Collegiate Country Life Club, which meets twice each month, deals with country life problems other than those having to do with the technical side of farming.

The college Y. M. C. A. meetings, conducted by students and outside speakers, are held regularly on Thursday evenings, at 6:45 o'clock, in the Chapel. There is also a students' Catholic Club, which holds periodical meetings. All winter school students are cordially invited to affiliate themselves with these organizations.

SOCIAL EVENTS AND SPECIAL FEATURES

To the end that a spirit of friendship and acquaintance may be promoted among winter course students, a series of special meetings of interest to all will be arranged. While a large number of these meetings will be purely social, it is planned to have able speakers address the students occasionally, dealing with topics of general interest. A faculty committee has been appointed to attend to this matter. A committee will be appointed from among the winter course students to cooperate with the faculty committee in arranging these events.

THE LIBRARY

The college library occupies the entire lower floor of the Chapel building and contains nearly 52,000 volumes in addition to a large number of pamphlets. The equipment is such that the library ranks extremely well with the agricultural libraries of the country. Short course, as well as regular students, are able to find splendid material in every line of college work, especially in agriculture, horticulture, botany, entomology and sociology. The reading room is provided with a variety of magazines, encyclopedias and reference books, in addition to the newspapers and agricultural weeklies. Branch libraries and reading rooms are maintained in some of the department buildings and these are open to short course students.

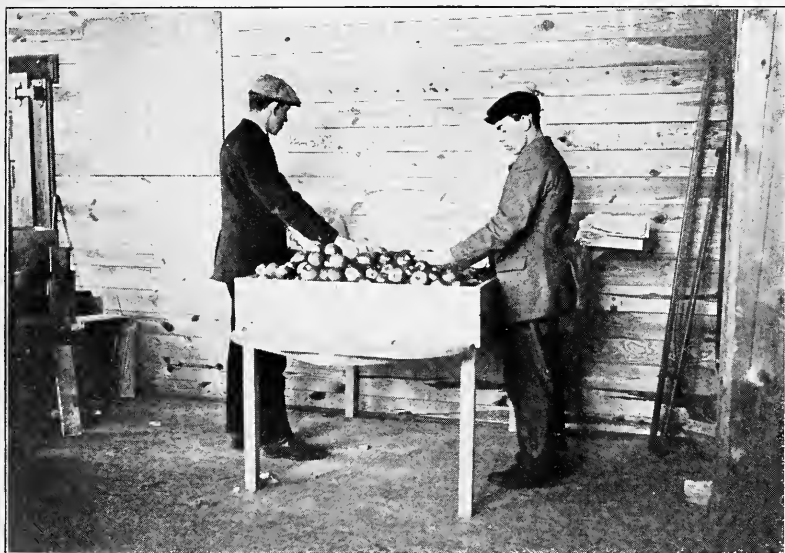
The library hours are from seven-thirty a. m. to nine-thirty p. m. excepting meal time every week day, and from nine a. m. to two p. m. on Sundays, chapel hour excepted. The librarian and his assistants are constantly on hand, ready and willing to be of assistance to short course students.

OTHER WINTER SHORT COURSES

APPLE PACKING SCHOOL

October 3 to 7, (inc.) 1916

The apple grading law which was passed by the last Legislature calls for radical changes in preparing this fruit for market. In order to meet the demand for definite information



APPLE PACKING

on this subject it was decided to hold the Apple Packing School sufficiently early to be of assistance this fall to those who might be able to take advantage of it. This school is supervised by the Department of Pomology and consists very largely of practice work in packing fruit in barrels, boxes, and fancy packages. This work is supplemented by lectures upon different phases of the apple industry. A small fee is charged to help pay for fruit and other materials used in the work. Owing to lack of facilities to handle a large number, the registration is usually limited.

FARMERS' WEEK

March 26 to 30, 1917

In order to reach those who cannot come to the college for a longer time, this very practical course, four days in length, is given. The regular college equipment is used, and the work of the regular faculty is supplemented by lectures and demonstrations given by prominent men.

The 1917 program will probably consist of 7 sections: (1) Field Crops and Farm Management; (2) Animal Husbandry and Dairying; (3) Poultry Husbandry; (4) Fruit Growing, Market Gardening, Floriculture, and Forestry; (5) Women's Section, Home Economics; (6) Farmers' Business Organizations; (7) Beekeeping.

Features of the week are the evening lectures by specialists along agricultural lines, the practical demonstrations of approved methods in agriculture and home economics, the milk, cream and butter exhibit, the corn and potato shows, the commercial exhibits and agricultural motion pictures.

Exceptionally good examples of the dairy breeds of cattle and of draft horses are used during this week and a parade of livestock is arranged.

There are exhibits of poultry feeds, various types of houses and poultry house equipment. The incubators and brooders are running to their fullest capacity at this time of year and guides are furnished to conduct visitors about the poultry plant.

The Annual Beekeepers' Convention, March 27 to 29, is also a feature of the week. Illustrated lectures, practical demonstrations and commercial displays are features of the convention.



BIRDS-EYE VIEW OF CAMPUS

The M. A. C. Short Course Association and other organizations hold their annual meetings at the college this week.

The complete program will be published about February 1. Apply to the Supervisor of Short Courses.

POLISH FARMERS' DAY

March 22, 1917

A special day is set aside in March of each year which is known as Polish Farmers' Day. There are hundreds of Polish farmers in the Connecticut Valley and this day represents a special effort on the part of the college to be of service to them. Instruction is given relative to the crops and animals in which these people are most interested, soil fertility problems, co-operation, American citizenship, Polish and American history, etc. The services of an interpreter make the days' exercises of added interest and value.

SCHOOL FOR BEEKEEPERS

Date to be announced

This itinerant school is held in Amherst once in three years and extension schools are planned for different sections of the state during the intervening years. It is an intensive course, primarily for a limited number of practical beekeepers. The course, conducted by a strong staff of specialists, occupies seven hours daily for two weeks (Saturdays being devoted to excursions), and comprises lectures, laboratory practicums and field excursions. As this school was held at the college in 1916, it will be located in some other section of the state in 1917. Announcement of date and place will be made later. The course is under the direction of Burton N. Gates, Associate Professor of Beekeeping.

SUMMER SCHOOLS

1917

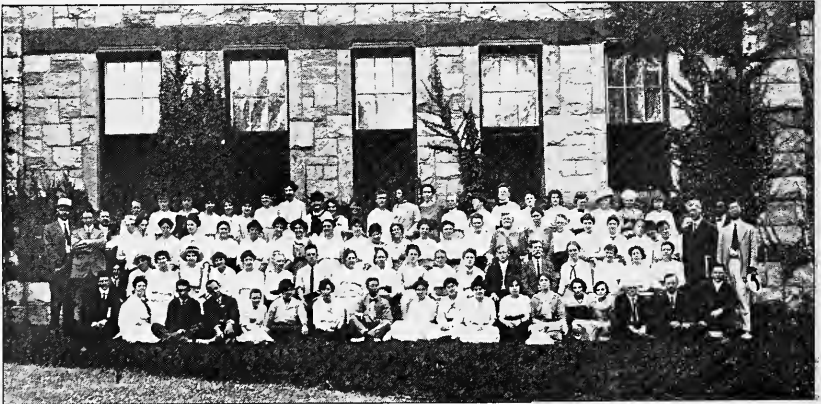
THE SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

July 2 to 31, 1917

Announcement

The Summer School of Agriculture and Country Life of the Massachusetts Agricultural College will open July 2, 1917 for a term of four weeks. This will be the tenth session of this Summer School, those of past years having been highly successful. The experience of past years will aid in making material improvements in the session of 1917.

The work of the Summer School was designed originally for school teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again in 1917. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture and who can come to the college conveniently during the summer season. Practical courses will be offered for the benefit of such persons also.



A SUMMER SCHOOL GROUP

The following courses are planned for 1917:

Soil Fertility	General Botany
Breeds and Types of Livestock	Ferns and Flowerless Plants
Modern Dairying	Bird Life
Dairy Laboratory	Insect Life
Poultry Breeding and Management	Collecting in Entomology
Farm Management	Beekeeping
Farm Accounts	Foods and House Construction
Farmers' Exchanges	Household Administration
Fruit Growing	Personal Hygiene and Home Nurs- ing
Vegetable Gardening	General Home Economics
Amateur Floriculture	Home Economics for Rural and Small Village Schools
Garden Flowers	Sewing
Forestry	Design and Practical Arts (1)
Garden Making	Practical Arts (2)
Civic Improvement	Organized Play and Recreation
Chemistry of Fertilizers	Plays and Pageantry
Chemistry of Insecticides	Elementary Agriculture
Plant Experiments and School Demonstration Material	

From these courses it is possible to make up programs of work suitable to the needs of almost everyone, but especially of school teachers, principals, superintendents, school committeemen, farm owners, householders, suburban residents, clergymen, pastors, preachers, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses will best suit their needs should correspond with the Supervisor of Short Courses, who will gladly advise in all such matters.

A number of special courses known as the "School for Rural Social Service," are offered for various groups of rural leaders.

General Plans

From the several courses offered, each student may elect not less than ten or more than fifteen exercises a week, unless a larger or smaller amount of work is allowed by the Supervisor. These courses include a large amount of field work, observation trips, out-door exercises and laboratory experiments.

Besides these, general field exercises are arranged for one afternoon of each week. These are on topics of interest to all. Short excursions are arranged for every Wednesday afternoon, and more extended excursions for the whole school are planned for every Saturday. These excursions are personally conducted by members of the faculty, as heretofore. In the past they have proved a very enjoyable feature of the work.

Round tables and special discussions are arranged by various instructors, as their courses require.

A course of evening lectures on popular topics relating to the work of the school is a feature of the general program. Several able lecturers are engaged for this course each year.

The expenses are low. Amherst is situated in one of the most noted historical and educational centers in the country. Anyone interested in problems pertaining to country life should not fail to attend. A descriptive circular can be had April 1, 1916.

SCHOOL FOR RURAL SOCIAL SERVICE

During July

This year special emphasis will be laid upon the group of courses given particularly for those who might be classed as rural social workers. These courses last year were primarily for clergymen, teachers and workers with women and girls.

The courses offered presented the rural problem from several standpoints, and served to show the relationships of the workers in the different lines to their respective fields and to the larger community problems which are constantly being presented to them.

Courses Offered

Home and School Gardens
Redirection of the Rural School
Gardening and Canning
The New Rural School
Health

Organization for Women and Girls
Practical Agriculture
Cooperation and Marketing
The New Rural Church
Rural Community Planning

Several of the courses offered in the regular Summer School of Agriculture and Country Life are also available to those who register in the School for Rural Social Service and pay the required fees.

SCHOOL FOR LIBRARY WORKERS

July 16 to 28

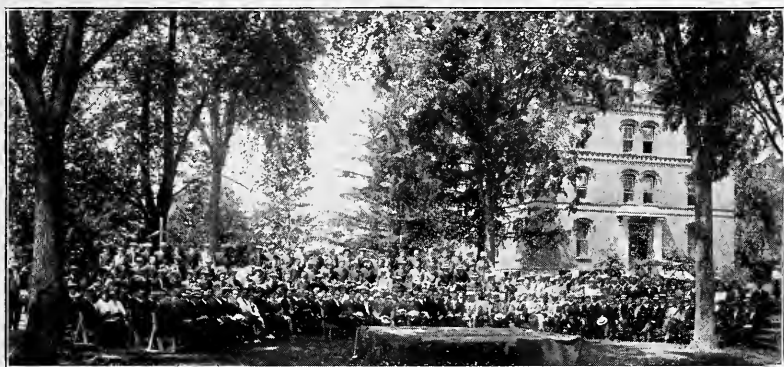
During the summer of 1915 a one-week School for Library Workers was held at the College. This was planned for persons interested in the work of the small village or rural library and more especially for those librarians and library assistants who had not been able to benefit by special library training or extended experience. Plans are under way to repeat this school in 1917 at which time it is hoped that a large number of library workers may avail themselves of the advantages of the school. The length of the school has been increased from one to two weeks.

THE POULTRY CONVENTION

July 25, 26 and 27

In the preparation of our Fifth Annual Poultry Convention the wishes and needs of the poultrymen and women of the State will be the first and only consideration. It is not often that the poultry public has an opportunity to hear men of national reputation from different parts of the country and it is such men that we secure for this occasion.

The special features of the program for 1917 will be as follows:



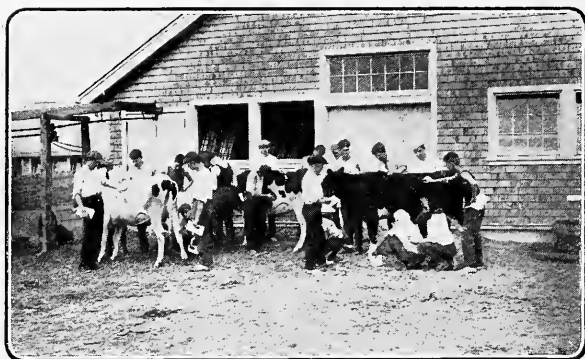
A POULTRY CONVENTION GROUP

1. Lectures by the best talent that can be secured.
2. Demonstrations in killing, picking, packing and preparation for retail trade.
3. Demonstrations in grading and judging market eggs.
4. Demonstrations in selection and mating both for utility and exhibition purposes.
5. Demonstrations with poultry equipment.
6. Poultry museum. Samples of feeds, equipment, diseased specimens, charts, etc.
7. A small poultry farm in Massachusetts. This will be made one of the special features of the program.

Program ready June 1st.

BOYS' AND GIRLS' AGRICULTURAL CAMPS

During July. Dates to be announced



These camps are arranged in order that boys from rural districts and small towns may receive some instruction in agriculture and clean, wholesome sports, and that they may have impressed upon

them their responsibilities as coming members of society. Teachers, clergymen, Y. M. C. A. workers and county agents are especially urged to send boys who will be benefited by the instruction given at these Camps.

The main purpose of these camps is fourfold:

1. To interest the boy in agriculture and country life. This is the primary object.
2. To impress on the boy his responsibilities as a member of society.
3. To teach the boy clean, wholesome sports, recreation, and proper spirit in competitive contests.
4. To demonstrate the value of a Boys' Camp as an educational factor.

The Camps are under military discipline. Not more than forty-two boys—reservation being made for three from each county—will be taken at one time, therefore application should be made early. A succession of these camps, each lasting one week, will be arranged during July. The college feels it has a direct duty to the boys of the state whose inclinations draw them toward agricultural pursuits. In addition to instruction along agricultural lines there will be a well balanced program of instruction in some of the vital problems of life, and periods will be devoted to athletics and other forms of recreation. The cost to each boy has, in the past, been eight dollars for the week. This fee helps defray the cost of maintaining the camp, meals, instruction, lectures, and so forth.

The daily program consists of Camp duty, flag raising, agricultural lessons, talks on hygiene and good citizenship,

play and recreation, instruction in handicrafts and photography, evening camp fires, and lectures by men prominent in boys' work. The regular instructors of the college give practical talks on various agricultural specialties, these talks being followed by demonstrations and by inspection of the departmental equipment, such as the Dairy, Poultry Plant, Orchards, etc.

Features of the agricultural work are the stock-judging contests, corn-judging contests, operation of the Babcock milk test and similar specialties. The talks by the different instructors are made very practical and the boys are given every opportunity to participate in the various lines of agriculture which are outlined.

During the past two years the third camp has been composed of the third prize winners in the state-wide boys' and girls' clubs, a separate camp being maintained upon the same general plan for the girl winners. This will undoubtedly be a feature of these camps in the future.

Opportunities are given for those interested to receive instruction under special teachers in basketry, photography, stock-judging, whittling, surveying and map reading, wireless telegraphy, wig-wagging, shop work, first aid, rope tying and splicing, seed testing, military drill, bird study, etc. Other features are the camp newspaper, minstrels and vaudeville, debates and mock trial and the camp circus.

CONFERENCE ON RURAL ORGANIZATION

Dates to be announced

At this time it is undecided as to just what form this annual conference will take. Various plans are under consideration and announcements will be issued in ample time for interested persons to make plans to attend.

THE EXTENSION SERVICE

HELPS FOR THOSE WHO CANNOT COME TO THE COLLEGE

LECTURE COURSES AND DEMONSTRATIONS

The public lecture work of the faculty has been systematized. Granges, Farmers' Clubs, Young Men's Christian Associations, Boards of Trade, Women's Clubs, Village Improvement Societies and other organizations can secure single lectures covering agriculture and allied subjects or courses of several lectures can be arranged. Many of these lectures are

arranged in cooperation with the Farm Bureaus and County Agents where these are already in the field. Practical demonstrations on such subjects as spraying, milk testing, stock-judging, mixing fertilizers, fruit grading and packing, and others of a similar nature, will also be given when application is made for them. Organizations named above can arrange with the college to have a series of evening meetings, at which agricultural subjects and topics pertaining to rural life will be presented in a popular way. It should be understood that the number of men available for this work is at present limited; hence early application is desirable. The first duty of the regular faculty, of course, lies with their college classes and no engagements will be made by them which seriously interfere with their regular work.

Send for circular giving lecturers' names and subjects.

CORRESPONDENCE COURSES

So many calls have come to the college for lessons by correspondence that courses in Soils and Soil Improvement, Manures and Fertilizers, Field Crops, Apple Growing, Small Fruit Growing, Market Gardening, Farm Accounts, Beekeeping, Forestry, Shade Tree Management, Entomology, Poultry Husbandry, Rural Sociology and Home Economics have been prepared.

A small fee which partially covers the cost of postage, etc., is charged for each course. Send for circular fully describing these.

OTHER LINES OF WORK CONDUCTED BY THE EXTENSION SERVICE

Through its Extension Service the Massachusetts Agricultural College endeavors to serve all the people in the Commonwealth who are interested in securing agricultural information. A corps of field agents is maintained to carry up-to-date information to all who desire it.

The college is now prepared to do definite, organized work in the following lines:

Extension Schools
Exhibits at Fairs, etc.
Community Organization
Agricultural Surveys
Farmers' Business Cooperation
Fruit Growing
Dairying
Animal Husbandry
Poultry Management
Farm Management (Cooperating
with U. S. D. A.)

Civic Improvement
Junior Extension Work. (Boys' and
Girls' Clubs, etc.)
Home Economics
Rural Credit Systems
Demonstration Plots
Advisory Work With Institutions and
Individuals
Publications
Advice by Personal Conferences and
Letters

The college is in constant and intimate touch with the farm bureaus, improvement leagues and county agents throughout the state and much extension work is done through these agencies. The college also stands ready to cooperate with granges, farmers' organizations, and commercial bodies in the furtherance of substantial extension work.

For further information regarding any of the activities of the Extension Service or to register in any of the Short Courses, write or apply to

William D. Hurd,

Director of the Extension Service and Supervisor of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

**DIRECTORY — INFORMATION MAY BE SECURED FROM THE
MASSACHUSETTS AGRICULTURAL COLLEGE AS
INDICATED BELOW**

A. The College

Those desiring college catalogs, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Ralph J. Watts, Secretary, Amherst, Mass.

All questions regarding admission to the College, either to the freshman class or to advanced standing should be addressed to Professor P. B. Hasbrouck, Registrar, Amherst, Mass.

B. The Experiment Station

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs and milk testing apparatus. Branch stations in cranberry and asparagus culture are maintained in other sections of the state.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections and for other information on the work of the station should be addressed to William P. Brooks, Director of the Experiment Station, Amherst, Mass.

C. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Charles E. Marshall, Director of the Graduate School, Amherst, Mass.

D. The Extension Service and Short Courses

Inquiries of a general nature regarding the work of the Extension Service, the Short Courses, extension publications, or requests for new lines of work should be addressed to William D. Hurd, Director of the Extension Service and Supervisor of Short Courses, Amherst, Mass.



